

EXHIBIT K

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Attorneys for Defendants

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
SOUTHERN DIVISION

SERENA FLEITES and JANE DOE
NOS. 1 through 33,

Plaintiffs,

v.

MINDGEEK S.A.R.L.; MG
FREESITES, LTD; MINDGEEK USA
INCORPORATED; MG PREMIUM
LTD.; RK HOLDINGS USA INC.; MG
GLOBAL ENTERTAINMENT INC.;
TRAFFICJUNKY INC.; BERND
BERGMAIR; FERAS ANTOON;
DAVID TASSILLO; COREY
URMAN; VISA INC.; COLBECK
CAPITAL DOES 1-10; BERGMAIR
DOES 1-10

Defendants.

CASE NO. 2:21-CV-04920-CJC-ADS

Judicial Officer: Cormac J. Carney
Courtroom: 9B

**DECLARATION OF ANDREAS
ALKIVIADES ANDREOU IN
SUPPORT OF THE MINDGEEK
DEFENDANTS' MOTION TO
DISMISS**

Hearing: January 24, 2022
Time: 1:30 p.m.
Courtroom: 9B

1 I, Andreas Alkiviades Andreou, hereby declare as follows:

2 1. I am employed by MG CY Holdings Ltd as Director of Corporate
3 Finance, a position which I have held since 2013. I have also served as a Class
4 A manager (the equivalent of a director) for MindGeek S.à.r.l. since 2016.

5 2. Through my employment and experience, I am familiar with the
6 corporate structure and operations of all the existing MindGeek corporate
7 entities named in Plaintiffs' Complaint – MindGeek S.à.r.l., MG Freesites Ltd,
8 MindGeek USA Incorporated, MG Premium Ltd, and MG Global
9 Entertainment Inc. (the "MindGeek corporate entities"). Almost every day, as
10 part of my regular job responsibilities, I deal with issues involving the corporate
11 structure of these legal entities in some capacity.

12 3. I have reviewed the Complaint filed in the instant action and am
13 familiar with the allegations made regarding the structure and operations of the
14 MindGeek corporate entities.

15 4. MindGeek S.à.r.l. is a private limited liability company (*société à*
16 *responsabilité limitée*) incorporated under the laws of Luxembourg, having its
17 registered office at 32, boulevard Royal, L-2449 Luxembourg and registered
18 with the Luxembourg Register of Commerce and Companies (R.C.S.
19 Luxembourg) ("RCS") under number B 181337.

20 5. MindGeek S.à.r.l. serves as the ultimate parent corporation of MG
21 Freesites Ltd, MindGeek USA Incorporated, MG Premium Ltd, and MG
22 Global Entertainment Inc. MindGeek S.à.r.l. does not exercise control over the
23 day-to-day decisions of the MindGeek corporate entities.

24 6. MindGeek S.à.r.l. is nothing more than a holding company, without
25 any employees or operations of its own, that directly and indirectly owns
26 certain affiliated entities. MindGeek S.à.r.l. does not have any offices or
27 employees in the State of California, let alone the United States.
28

1 7. MindGeek S.à.r.l. is adequately capitalized, both possessing its own
2 bank accounts and serving as a party to and responsible for fulfilling its own
3 contracts. MindGeek S.à.r.l. also has the equivalent of its own designated
4 board of directors and observes all necessary corporate formalities.

5 8. MG Freesites Ltd is a foreign limited liability company organized and
6 operating under the laws of the Republic of Cyprus, having its head office at
7 195-197 Old Nicosia-Limassol Road, Block 1 Dali Industrial Zone, Cyprus.

8 9. MG Freesites Ltd is responsible for operating certain websites,
9 referred to as “tubesites,” including “PornHub,” which offer non-subscription
10 content. MG Freesites Ltd operates associated websites, including “PornHub
11 Premium,” which offer certain subscription content. MG Freesites Ltd also
12 operates the ModelHub program and Content Partner Program.

13 10. MG Freesites Ltd does not have any offices or employees in the
14 State of California, or in the United States.

15 11. MG Freesites Ltd is adequately capitalized, both possessing its own
16 bank accounts and serving as a party to and responsible for fulfilling its own
17 contracts. MG Freesites Ltd also has the equivalent of its own designated board
18 of directors and observes all necessary corporate formalities.

19 12. The content managed by MG Freesites Ltd is accessible worldwide,
20 with no particular focus on California. In 2020, California residents accounted
21 for approximately 13% of total United States site traffic on PornHub, and
22 approximately 15% of United States site traffic on PornHub Premium.

23 13. MindGeek USA Incorporated is a corporation incorporated under
24 the laws of the State of Delaware, having its principal executive office at 21800
25 Oxnard Street, Suite 150, Woodland Hills, California 91367 United States of
26 America.

1 14. MindGeek USA Incorporated's sole function is to distribute DVD-
2 based content pursuant to the terms of one contract. MindGeek USA
3 Incorporated does not itself create, solicit, post, manage, or have any other
4 involvement with the website content at issue in the instant case.

5 15. MindGeek USA Incorporated is adequately capitalized, both
6 possessing its own bank accounts and serving as a party to and responsible for
7 fulfilling its own contracts. MindGeek USA Incorporated also has its own
8 designated board of directors and observes all necessary corporate formalities.

9 16. MG Premium Ltd is a limited liability company organized and
10 operating under the laws of the Republic of Cyprus, having its head office at
11 195-197 Old Nicosia-Limassol Road, Block 1 Dali Industrial Zone, Cyprus.

12 17. MG Premium Ltd is responsible for operating websites referred to
13 as "paysites," which offer certain subscription-based content. MG Premium
14 Ltd does not operate Pornhub or Pornhub Premium, the ModelHub program
15 or the Content Partner Program. MG Premium Ltd also holds intellectual
16 property rights to certain content that is not alleged to have anything to do with
17 the Plaintiffs.

18 18. MG Premium Ltd does not have any offices or employees in the
19 State of California, or in the United States.

20 19. MG Premium Ltd is adequately capitalized, both possessing its own
21 bank accounts and serving as a party to and responsible for fulfilling its own
22 contracts. MG Premium Ltd also has the equivalent of its own designated board
23 of directors and observes all necessary corporate formalities.

24 20. MG Global Entertainment Inc. is a corporation incorporated under
25 the laws of the State of Delaware, having its principal executive office at 21800
26 Oxnard Street, Suite 150, Woodland Hills, California 91367 United States of
27 America.

1 21. MG Global Entertainment Inc. is primarily responsible for
2 providing services for television-based business, with a focus on agreements
3 with cable operators, hotels, and cruise ships, among others.

4 22. MG Global Entertainment Inc. also provides limited support
5 services to other MindGeek corporate entities. Currently, three of its
6 employees have responsibilities concerning the content on MindGeek sites;
7 however, none of those employees reside or work in California and none are
8 alleged to have had anything to do with the Plaintiffs.

9 23. MG Global Entertainment Inc. is adequately capitalized, both
10 possessing its own bank accounts and serving as a party to and responsible for
11 fulfilling its own contracts. MG Global Entertainment Inc. also has its own
12 designated board of directors and observes all necessary corporate formalities.

13 24. To the extent any of the foregoing entities provides services for
14 another, the terms pursuant to which such services are provided are defined by
15 service contracts.


16 25. There is no legal entity with the name “RK Holdings USA Inc.” that
17 is incorporated in Florida and acts as “a wholly owned subsidiary of MindGeek
18 S.a.r.l.” or any other MindGeek corporate entity. I am unaware of the prior
19 existence of any such entity.

20 26. There is no legal entity with the name “Traffickjunky Inc.” that is
21 incorporated under the laws of Canada and acts as “a wholly owned subsidiary
22 of MindGeek S.a.r.l.” or any other MindGeek corporate entity. I am unaware
23 of the prior existence of any such entity.

1 I declare under penalty of perjury under the laws of the United States of
2 America that the foregoing is true and correct.

3
4 Date:

5 19 October 2021

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Andreas Alkiviades Andreou

EXHIBIT L



World > Europe

Fabian Thylmann, 'the ruler in the Realms of Lust', is arrested for alleged tax evasion

Fabian Thylmann makes \$100m a year from his online porn empire. Now the taxman is after him

Tony Paterson • Wednesday 12 December 2012 19:41 • [Comments](#)



'The Ruler in the Realm of Lust': Fabian Thylmann



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The reclusive 34-year-old German entrepreneur behind the world's most profitable online pornography empire is being held in a Belgian jail on suspicion of tax evasion.

State prosecutors in Cologne said they were pressing for the extradition of the internet porn king Fabian Thylmann on charges of avoiding paying tax on the \$100m his vast global online sex video network – which includes the lucrative Youporn website – is estimated to earn each year.

“The accusations concern Mr Thylmann himself and the companies he owns,” a state prosecutor’s spokesman said. Mr Thylmann, who lives in Belgium, said he was contesting the allegations.

Dubbed “The Ruler in the Realm of Lust” by the German media, Mr Thylmann only

year. “Our aim is banal: we create as many opportunities for people to spend money as possible,” he declared in an interview.

Notoriously publicity shy, Mr Thylmann looks like the archetypal computer nerd: he is pale faced, sports thick glasses and likes wearing hoodies. Yet he has revolutionised the business of pornography consumption in less than a decade.

With sex video sites including Youporn, Brazzers, PornHub and MyDirtyHobby, Mr Thylmann’s Manwin company is the online sex industry’s global leader. An estimated 16 billion visitors click on to Manwin- owned sex sites every month.

His breakthrough began in the late 1990s when he developed software called NATS (Next-generation Affiliate Tracking Software) which linked the vast number of internet pornography sites for the first time and enabled visitors to select sex films according to preference. The upshot was a surge in the production of amateur home sex videos catering for every conceivable sexual predilection.

The success of NATS encouraged Mr Thylmann to start his own online sex sites. He began in 2006 by securing a licence for the classic erotic Playboy label which gave him control of all of its television and online productions. Sixty million viewers surf Mr Thylmann’s porn sites each day. The revenues come from the pay pornography sites advertised alongside, which only a fraction of viewers sign up to.



Germany’s Die Welt newspaper says its journalists gained access to Manwin’s internal accounts which allegedly showed that although German actors performed for sex videos in Germany, they were paid illegally, by a subsidiary company in Cyprus.

Mr Thylmann denies he evaded tax and insists that he was merely minimising his tax burden in accordance with the law.

Fabian Thylmann

Just 34 years old, the German software developer has made a fortune after revolutionising the business of internet porn. His string of sex websites attracts 60 billion visitors every month

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Fabian Thylmann Sentenced for Tax Evasion in Germany 1 year ago

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— Entertainment

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COLOGNE, Germany—Fabian Thylmann, the former managing director of Manwin, has been sentenced to a year and four months in prison for tax evasion in Germany.

The regional court of Aachen also imposed a money deposit of 150,000 euros, according to German news site Ostsee-Zeitung. Thylmann admitted he did not submit any income and commercial tax returns for his years 2005 to 2010, the report said.

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Although the tax was appreciated by the tax authorities and paid by Thylmann, his income was in reality much higher than the estimate, according to Ostsee-Zeitung.

tps://avn.com/)

Another tax evasion case against Thylmann has been suspended this year against a financial imposition.

"He is clear that the failure to make tax returns was a fault he was responsible for, which he at the time accepted," Thylmann's lawyer said Monday. "Today he regrets that."

The prosecutor's office and defense waived appeal and the judgment is final, according to the report.

Thylmann settled a separate criminal tax evasion case against him with the Cologne Public Prosecutors' Office for a sum of five million euros in November.

Server Image
visitorHash=)

German prosecutors had originally ordered Thylmann to pay back more than 26 million euros in corporate taxes from 2008-12 because services provided by a number of his foreign companies originated from Germany. However, the evidence in the preliminary investigation that had been underway since 2012 did not suffice.

Thylmann was arrested in Belgium and police raided the Hamburg offices of Manwin in December 2012. He was extradited to Germany and eventually paid 10 million euros to return to his home in Belgium before a possible trial. In October 2013, Thylmann sold his stake in Manwin, which is now known as Mindgeek, and issued a statement saying he was no longer associated with the company.

Mindgeek owns several adult brands, including Brazzers, Digital Playground, Reality Kings, YouPorn and PornHub, and the company also manages Playboy's web and broadcast properties. Its various arms are registered in Luxembourg, Germany, Canada, Cyprus, the United States and Ireland.

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(<http://web.archive.org/web/20221206111922/https://avn.com/porn-stars/Dan-Miller-236080.html>)

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EXHIBIT N



MindGeek Becomes Aylo



MindGeek Becomes Aylo

A Fresh Start to Embrace Innovation, Diverse and Inclusive Adult Content, and Trust and Safety

Montreal, Quebec (August 17, 2023) – MindGeek, a technology and media company, owner of a large portfolio of adult entertainment properties, including Pornhub, Brazzers, Men.com, Trans Angels and Nutaku, is excited to announce its corporate rebrand and name change, driven by the valuable input from its dedicated employees, stakeholders and ownership group. The decision to rebrand the company as Aylo, comes in response to the need for a fresh start and a renewed commitment to innovation, diverse and inclusive adult content, and trust and safety.

Launched in 2004, the company has grown considerably, becoming an industry leader and tech pioneer. This growth, and the company's newest chapter under the ownership of [Ethical Capital Partners](#) (ECP), meant that it was time for a new brand that aligns with the employees' values and aspirations. Our people, recognizing the importance of an updated identity, voiced their concerns and expressed the desire for a name that truly represents them and allows the company to re-focus its efforts to lead by example, through transparency and public engagement. Aylo's strong foundation comprises the efforts made, innovations developed, and communities built by employees over the years. These sentiments have been echoed by stakeholders and are shared by ECP.

The new name, Aylo, symbolizes a fresh beginning, reflecting our dedication to being a global leading tech platform that empowers hundreds of thousands of creators to earn a living, that employs innovative employees, and that provides hundreds of millions of users worldwide with safe content. This rebrand not only marks a pivotal moment for our company but also emphasizes our commitment to our employees, the content creator community, and the millions of adult users who visit our sites every day.

The new brand identity will be implemented across all company communications, marketing materials and

Quotes

"While you won't find "Aylo" in a dictionary, we see this as an opportunity to infuse our new corporate name with meaning. Our goal is for "Aylo" to be synonymous with our core principles: innovation, diverse and inclusive adult content, and trust and safety. We wanted a fresh start, so we opted for a name that gave us that freedom, so that our team and our new owners could define it how we want. Thank you to all employees for their unwavering commitment over the years and for their valuable input throughout this rebranding process."

- Aylo Management

"My colleagues and I are proud to work at Aylo, and we are eager to build this brand as a tech leader. The Pornhub team is excited to be a part of Aylo and will continue to provide a safe space for verified content creators and the entire adult entertainment community to share, monetize and enjoy content. Under this new banner, we will continue to commit to our core values of consent, freedom of sexual expression, authenticity, originality, and diversity."

- Alex Kekesi, VP Brand and Community, Pornhub

"Since March 2023, as the new owners of MindGeek, now Aylo, [we committed to meeting with employees and external stakeholders](#). We heard from our colleagues that they needed a fresh start. At the same time ECP, also committed to be more present in conversations that impact Aylo's business, along with plans to correct misinformation and public perception about the company, who they are, and how they present themselves to the world. This new public mission requires a new public brand. This is but a first step, we will continue to communicate our efforts to position Aylo as a leader in innovation, diverse and inclusive adult content, and trust and safety."

- Sarah Bain, VP Public Engagement, ECP

Quick Facts

Aylo is charting its own path forward separate from other companies in its space. We separate ourselves by doing things no other company does.

Aylo pioneered the initiative to ID verify every single person who uploads content.

Aylo has engaged with more than 70 non-profit organizations globally to combat CSAM and NCC.

Aylo is among the first adult content companies to register and report to the [National Center for Missing & Exploited Children](#) (NCMEC), a leading non-profit organization whose mission it is to reduce child exploitation and prevent child victimization. [According to NCMEC's reports](#), Aylo's platforms are some of the few adult platforms self-reporting instances of potential CSAM and among the fastest in actioning reports received from the CyberTipline

Related products



About Aylo

The intersection of technology and culture

Launched in 2004, Aylo is a tech pioneer offering world class adult content platforms. The company provides trusted environments to enable a safe online user experience, and to empower its communities by celebrating diversity, inclusion and expression. Aylo holds a number of widely popular and diverse online adult entertainment and gaming properties. Its portfolio includes Pornhub, YouPorn, Brazzers, Men.com, Nutaku, and more, all of which maintain robust trust and safety protocols.

About Ethical Capital Partners (ECP)

Unlocking value through ethics-first investing. Ethical Capital Partners (ECP) is a private equity firm seeking out investment opportunities in industries that require principled ethical leadership. ECP invests in projects which focus on technologies, and have legal and regulatory complexity. ECP was created in 2022 by a multi-disciplinary team with legal, regulatory, law enforcement, public engagement and finance experience. ECP's philosophy is rooted in identifying properties amenable to our responsible investment approach and that have the potential to create attractive returns over a compelling time horizon. For more information visit EthicalCapitalPartners.com.

Contacts

For media inquiries, please contact the Aylo Communication Department.

media@aylo.com

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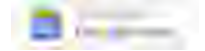
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MindGeek become Aylo: Battling lawsuits, Pornhub parent gets a name change

By [HT News Desk](#)

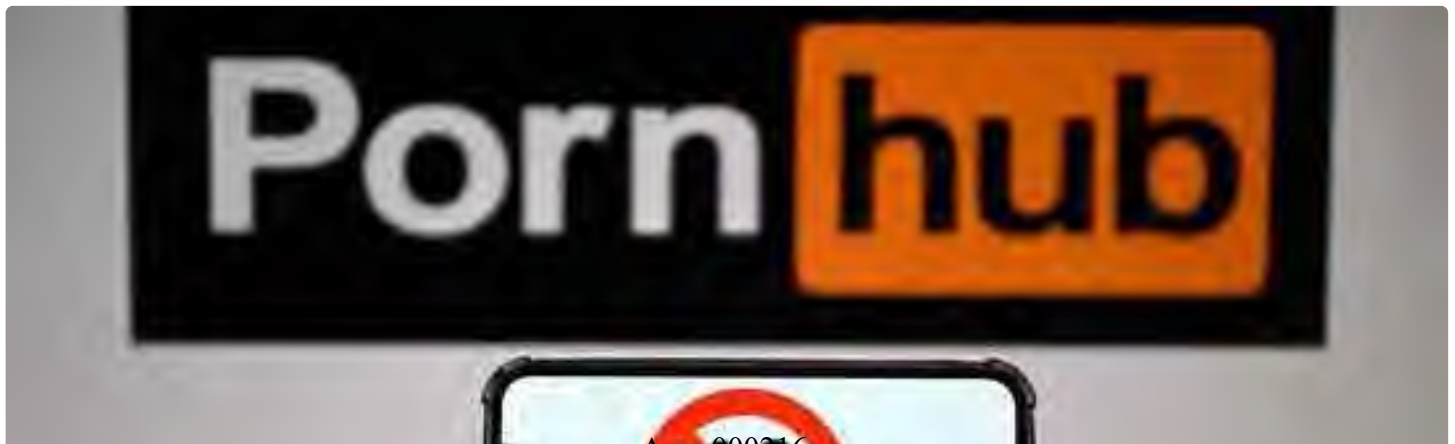
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Pornhub parent company MindGeek changes its name to Aylo amid lawsuits and controversy.

Story continues below advertisement

MindGeek, the company that owns a host of adult entertainment properties including Pornhub, is getting a name change. MindGeek will henceforth be referred to as Aylo. A statement from the Montreal-based company stated: "The decision to rebrand the company as Aylo comes in response to the need for a fresh start and a renewed commitment to innovation, diverse and inclusive adult content, and trust and safety," the Montreal-based company said in an Aug. 17 statement.



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his photograph taken on May 24, 2022 in Toulouse shows screens displaying a minor child sign and the logo of the pornographic site Pornhub. (AFP)

Story continues below advertisement

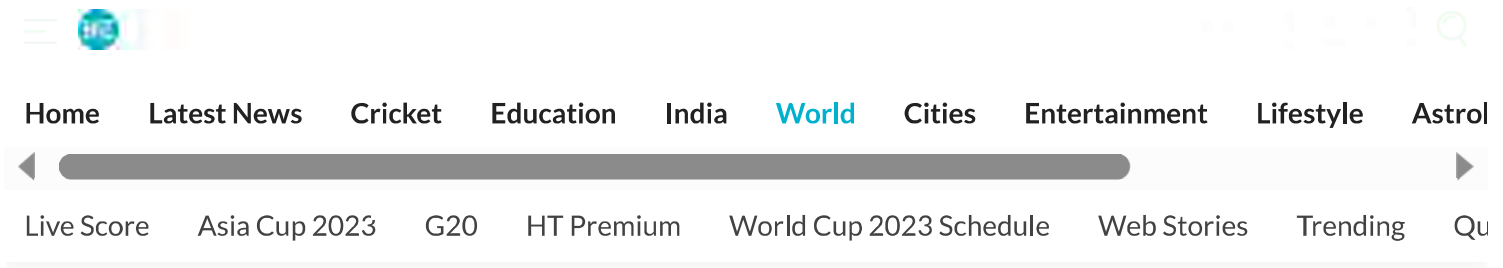
While Aylo can't be found in any English dictionary of note, Urban Dictionary has this to offer: "Aylo is the most fun person you will ever meet. She always knows how to make you smile and understands what you are going through. She is also always easy to talk to if you need some advice. If you ever come across an Aylo, keep her close."

Earlier in March, Ethical Capital Partners, a private-equity firm in Ottawa, Ontario, Canada, acquired MindGeek. ECP claimed its raison d'être was to build "trust and safety" and to make the company the "internet leader in fighting illegal online content".

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The name change comes amid lawsuits which accuse it of profiting from child pornography and non-consensual sex videos. The company claims the allegations lack merit. In the last year, both Visa and Mastercard stopped payment processing to the ad division that sells ads on Pornhub. Both YouTube and Instagram have also removed Pornhub's accounts.

Story continues below advertisement



The company states that the name Aylo, which is gibberish and can't be found in any dictionary, reflects a new beginning which would seek to "empower hundreds of thousands of creators to earn a living" and also provide "hundreds of millions of users worldwide with safe content".

Sarah Bain, VP Of public engagement at ECP, said: "Since March 2023, as the new owners of MindGeek, now Aylo, we committed to meeting with employees and external stakeholders. We heard from our colleagues that they needed a fresh start."

Alex Kekesi, VP of brand and community at Pornhub added, "The Pornhub team is excited to join Aylo and will continue to provide a safe space for verified content creators and the entire adult entertainment community to share, monetize and enjoy content. Under this new banner, we will continue to commit to our core values of consent, freedom of sexual expression, authenticity, originality and diversity."

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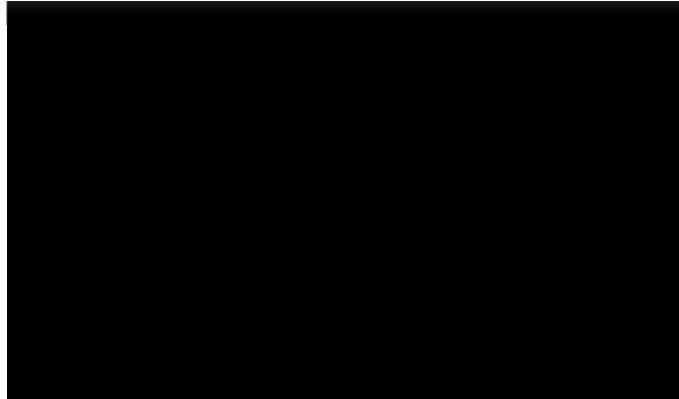


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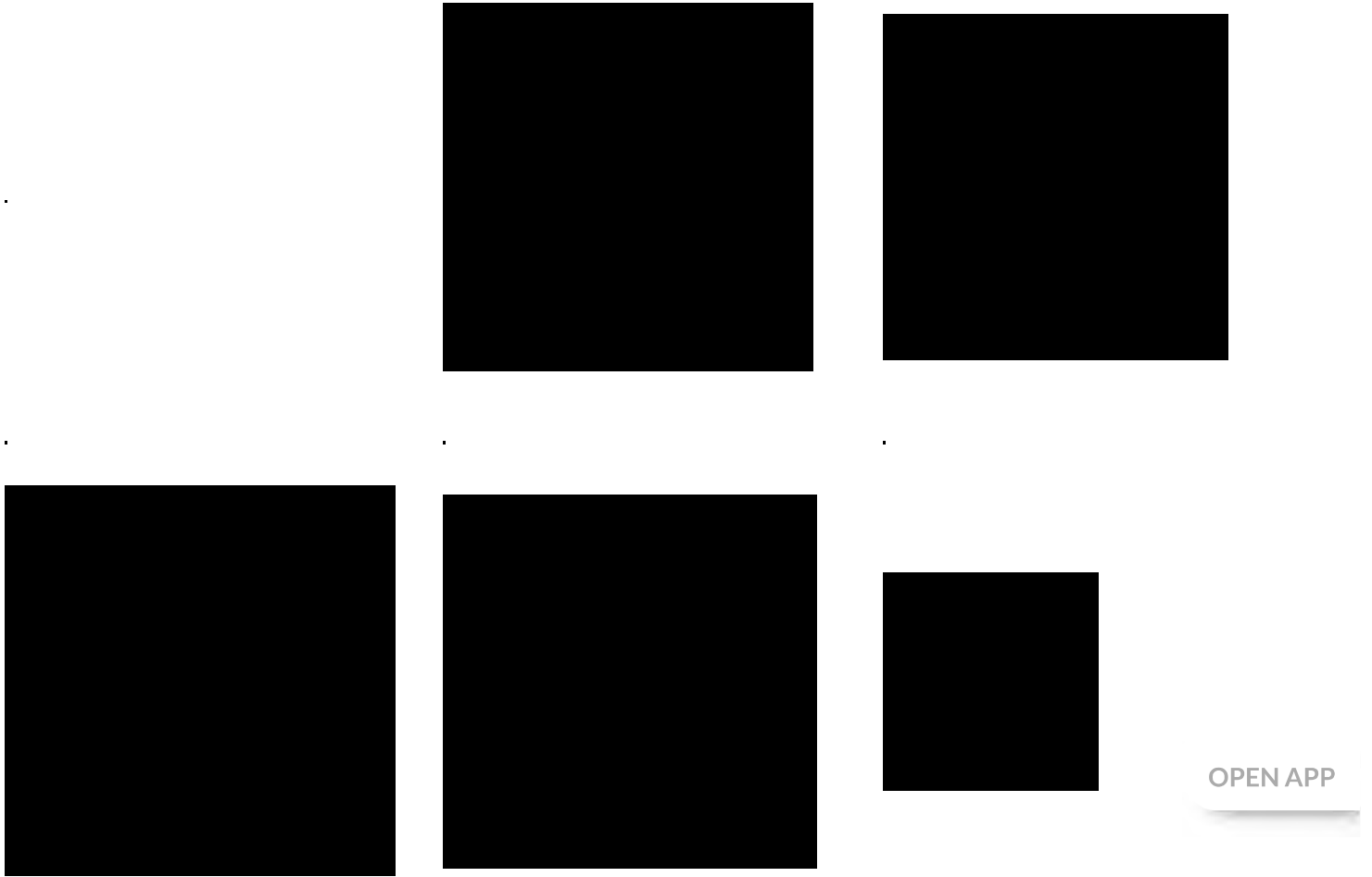
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Q SEARCH...

Congressional Briefing on MindGeek's Pornhub Empire

By: NCOSE(<https://endsexualexploitation.org/articles/author/ncose/>)
 April 9, 2021(<https://endsexualexploitation.org/articles/2021/04/09/>)



U.S. Congressional Briefing Packs a Powerful Punch Against MindGeek's Exploitation Empire

On April 8th, 2021, a Congressional briefing was held to uncover evidence of the criminality of Pornhub, and its parent company MindGeek. The briefing reached at least 70 members of Congress and their staff, as well as over 2000 registrants, including law enforcement, lawyers, journalists, and the general public.



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Uncovering the Evidence of Child Exploitation, Sex Trafficking, & Non...



Co-Hosts of the Briefing:

**Breaking Free • Coalition Against Trafficking in Women (CATW) • Mentari Human Trafficking
Survivor Empowerment Program • More Too Life • National Center on Sexual Exploitation •
Organization for Prostitution Survivors • Rights4Girls • SPACE International – USA • Christine Stark •
Survivors for Solutions • Traffickinghub • United Against Slavery**

MindGeek has exponentially come under public fire and scrutiny for hosting videos of child sexual abuse, rape, sex trafficking, and non-consensually recorded and/or distributed content since early 2020 as more survivors came forward with their stories. A December 2020 *New York Times* article, “The Children of Pornhub,” (<https://www.nytimes.com/2020/12/04/opinion/sunday/pornhub-rape-trafficking.html>) brought a lot of attention to these realities. Traffickinghub’s (<https://traffickinghub.com/>) petition, a campaign calling for accountability for Pornhub’s executives, has gained over 2 million supporters.

Meanwhile a new, global campaign aimed to tactically deconstruct (https://endsexualexploitation.org/featured/pornhub/?utm_source=endsexualexploitation.org/pornhub&utm_medium=redirect&utm_campaign=shut_down_pornhub) MindGeek and Pornhub’s infrastructure is underway, targeting corporations like Visa (<https://endsexualexploitation.org/featured/pornhub/dismantle-pornhub-consumer-services/>), Roku (<https://endsexualexploitation.org/featured/pornhub/dismantle-pornhub-distribution/>), Diesel (<https://endsexualexploitation.org/featured/pornhub/dismantle-pornhub-advertising/>), and more that support the sexual exploitation empire through advertising revenue, payment processing, distribution, and technology. The Canadian Parliament has hosted hearings and 70 Members of Parliament (<https://twitter.com/ArnoldViersen/status/1371498533740802054?s=20>) have called on law enforcement (<https://endsexualexploitation.org/articles/statement-ncose-commends-canadian-call-for-royal-mounted-police-investigation-into-mindgeek/>) to investigate Pornhub for criminal violations. 104 Survivors (<https://twitter.com/ncose/status/1366459559104163846?s=20>) and 525 NGOs from 65 countries have joined in calling (<https://endsexualexploitation.org/articles/statement-canadian-parliament-must-launch-criminal-investigation-into-mindgeek-say-survivors-and-ngos-from-65-countries/>) for criminal investigations as well. Six lawsuits have been filed in recent months as well.

The congressional briefing, Uncovering the Evidence of Child Exploitation, Sex Trafficking, and Non-consensual Content on Pornhub, featured 16 experts and survivors alike, all coming from different yet impressive backgrounds: lawyers rigorously investigating MindGeek, to law enforcement professionals, to former public representatives. All echoed the same message from various angles of experience: **That the time for action is long past due, and every moment this exploitative and deeply harmful company continues to operate with impunity is a moment that could have prevented the victimization of countless lives.**



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(<https://endsexualexploitation.org>)

The briefing exposed the MindGeek empire for what it really is—a corporation built on the monetization of sexual abuse and exploitation, profiting from rape and child sexual abuse, ignoring victims and survivors, and promoting and normalizing material featuring racism, misogyny, sexual violence and more.

Michael Bowe, a lawyer representing a survivor of Pornhub, talked about how he has spoken to over a hundred survivors who have similar stories to his client's.

“Serena [survivor, client] is an example of what has happened to thousands, maybe tens or hundreds of thousands of women.

The impact . . . doesn't end with the assault and the posting. It takes life away from women and derails their life.

This is an industry that is not occupied by responsible corporate actors . . . this is an industry, which for various reasons, grew up in illegality.

Nobody was better acquainted with what was on its site than MindGeek. It knew.

This is a group that is indicative of the entire industry. Within the industry it is not a rogue. The industry is a rogue industry, and it will not self-police.”

—Michael Bowe

The pornography industry profits from (<https://endsexualexploitation.org/articles/research-summary-the-rise-of-the-modern-online-pornography-industry-descriptions-and-implications/>) many outright crimes: assault, battery, fraud, sex trafficking, labor trafficking, rape, obscenity, defamation, and child sexual abuse. In any other industry, these crimes would be universally seen as unacceptable, and those responsible would be held accountable. However, MindGeek is allowed to not only host that content with impunity, but make millions of dollars from the trauma of men, women, and children.

Shandra Woworuntu (https://en.wikipedia.org/wiki/Shandra_Woworuntu), Serena Fleites, and Autumn Burris (<https://www.survivors4solutions.com/about>)—all survivors—emphasized the lifetime of trauma that they live through due to the abuse and exploitation they faced. These were heart wrenching accounts of trauma and abuse at the hands of this online titan of trafficking and empire of exploitation.

“The images and videos of my sex trafficking were uploaded online. The pain lasts forever.”

—Shandra Woworuntu

Pornhub's business model and internal structure are built on search engine optimization. It uses a scale network to have the most popular and profitable images appear first when consumers search for pornography online.

Laila Mickelwait, founder of the Traffickinghub movement, talked about how the National Center for Missing and Exploited Children demanded that Pornhub remove videos of child rape. MindGeek executives have admitted that while “child porn” would yield no search terms on Pornhub's site, a search on Google for the same term will link to Pornhub and drive traffic to its site. This means that instead of removing abusive titles, tags, and views, Pornhub continues using child abuse videos to drive traffic to their site via search engines.

Laila also outlined six core areas of criminal content on Pornhub—Sex Trafficking, Child Sexual Abuse Material, Rape, Incapacitated Sexual Assault, Revenge Porn, Hidden Cameras—going further to give detail and show internal documents with information about the moderation practices that laughably claim to keep this criminal content at bay.



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For context, MindGeek owns over 160 tube sites featuring this content, where millions of videos are being uploaded per year, and yet they are lax in ensuring robust content review.

“It’s not just the content that’s on the site. The fact is that Pornhub has been criminally negligent in their moderation practices.

In fact, we have documentation that they had, as of early 2020, under 10 Pornhub moderators per 8-hour shift. They actually had 30-31 total per day for all of MindGeek tube sites.”

—Laila Mickelwait

There is no form of degradation, humiliation, torture, or abuse that pornography has not attempted to sexualize, and MindGeek has known, condoned, and promoted these kinds of videos across Pornhub and their other pornography websites with abandon.

Dawn Hawkins, CEO of the National Center on Sexual Exploitation, discussed the list of proposed “improvements” MindGeek touts, using buzzwords such as “biometric user verification,” “improved moderation,” and “transparency reports.” She warns that MindGeek (<https://www.theglobeandmail.com/business/article-mindgeeks-business-practices-under-scrutiny-as-political-pressure/>) desperately hopes law enforcement, the government, and the public will overlook their criminal behavior. More importantly, they are hoping advertisers and payment processors like credit card companies will resume lining the pockets of MindGeek executives.

“Websites like Pornhub and XVideos cannot be made safe enough!

The superficial compromises that these websites are making right now—only after immense pressure—cannot do enough to prevent these abuse videos from being on their site.

The so-called “transparency report” released by Pornhub this week is not only further admission of their guilt as they admit that they viewed, approved, distributed, and monetized 653,000 sexual abuse videos, but it’s also full of lies.

For example, they claim not to allow incest of any kinds, yet 50% of the videos on their homepage yesterday contained incest themes based on the titles alone.”

—Dawn Hawkins

Attempting to apply regulations to the pornography industry and allowing this company to self-regulate will not work. This path will only lead to more victims. Any progress we gain in this fight for justice is simply not sustainable without the weight of criminal accountability, legal action, and a strong stance against exploitation from Congress.

MindGeek must be held accountable through our society’s court systems so that no corporation can get away with the rampant marginalization and exploitation of any people—especially the most vulnerable among us.

Congress and law enforcement must stop allowing a company to distribute and profit off the exploitation, trauma, abuse, rape, violence, and illegal content of men, women, and especially children with no lasting consequence.

TAKE ACTION

- Watch a replay of the briefing (<https://youtu.be/-wzhIfZAuCW>).

- Demand corporations cease partnerships with #Traffickinghub.
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[\(https://endsexualexploitation.org/featured/pornhub/\)](https://endsexualexploitation.org/featured/pornhub/)

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utm_source=endsexualexploitation.org/pornhub&utm_medium=redirect&utm_campaign=shut_down_pornhub)

- If you know survivors interested in suing these abuse websites, reach out here:

<https://sexualexploitationlawsuits.com> ([https://l.facebook.com/l.php?u=https%3A%2F%2Fsexualexploitationlawsuits.com%2F%3Ffbclid%3DIwAR1y65Y6vb3Tw_Un_go-fOIlBo6qZW8q8flcU0LyBuqgBk_LSgIYufpF_7E&h=AT0iFPZjqjw54pwbRT0DnboAbPF12s__UeZKwDUBJ7tyld7aOhi0Lk8iUPwhwFfC-5SJPDFCsy-fbdigbvFttqCOm7xgrEaBMHFwTa6Vqs&__tn__=-UK-R&c\[0\]=AT2kq6e67YcXB7bFZ2mjBMvjx4bzYgNkbwQh41kufAQ19Ih5rAnEnhHNy_mOOgevOfjrCc5leovDcCbonqurQzxXAiAvXay_4](https://l.facebook.com/l.php?u=https%3A%2F%2Fsexualexploitationlawsuits.com%2F%3Ffbclid%3DIwAR1y65Y6vb3Tw_Un_go-fOIlBo6qZW8q8flcU0LyBuqgBk_LSgIYufpF_7E&h=AT0iFPZjqjw54pwbRT0DnboAbPF12s__UeZKwDUBJ7tyld7aOhi0Lk8iUPwhwFfC-5SJPDFCsy-fbdigbvFttqCOm7xgrEaBMHFwTa6Vqs&__tn__=-UK-R&c[0]=AT2kq6e67YcXB7bFZ2mjBMvjx4bzYgNkbwQh41kufAQ19Ih5rAnEnhHNy_mOOgevOfjrCc5leovDcCbonqurQzxXAiAvXay_4))

- Tell Congress to investigate MindGeek.

ISSUES: PORNOGRAPHY

◆ ([HTTPS://ENDSEXUALEXPLOITATION.ORG/ARTICLES/ISSUE/PORNOGRAPHY/](https://endsexualexploitation.org/articles/issue/pornography/))

Further Reading



(<https://endsexualexploitation.org/articles/victory-google-blurs-explicit-images-and-improves-reporting-procedures/>)

VICTORY! Google Blurs Explicit Images and Improves Reporting Procedures

(<https://endsexualexploitation.org/articles/victory-google-blurs-explicit-images-and-improves-reporting-procedures/>)



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(<https://endsexualexploitation.org/articles/pornhub-parent-company-changes-name-in-attempt-to-sanitize-image/>)

Pornhub Parent Company Changes Name in Attempt to Sanitize Image

(<https://endsexualexploitation.org/articles/pornhub-parent-company-changes-name-in-attempt-to-sanitize-image/>)



(<https://endsexualexploitation.org/articles/pedophile-networks-exposed-on-instagram-ncose-urges-more-child-safety/>)

Pedophile Networks Exposed on Instagram, NCOSE Urges More Child Safety

(<https://endsexualexploitation.org/articles/pedophile-networks-exposed-on-instagram-ncose-urges-more-child-safety/>)

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THE NUMBERS

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INSTAGRAM MAKES POSITIVE SAFETY CHANGES VIA IMPROVED REPORTING AND DIRECT MESSAGE TOOLS

SHARING EXPERIENCES MAY BE A RESTORATIVE AND LIBERATING PROCESS. THIS IS A PLACE FOR THOSE WHO WANT TO EXPRESS THEIR STORY.



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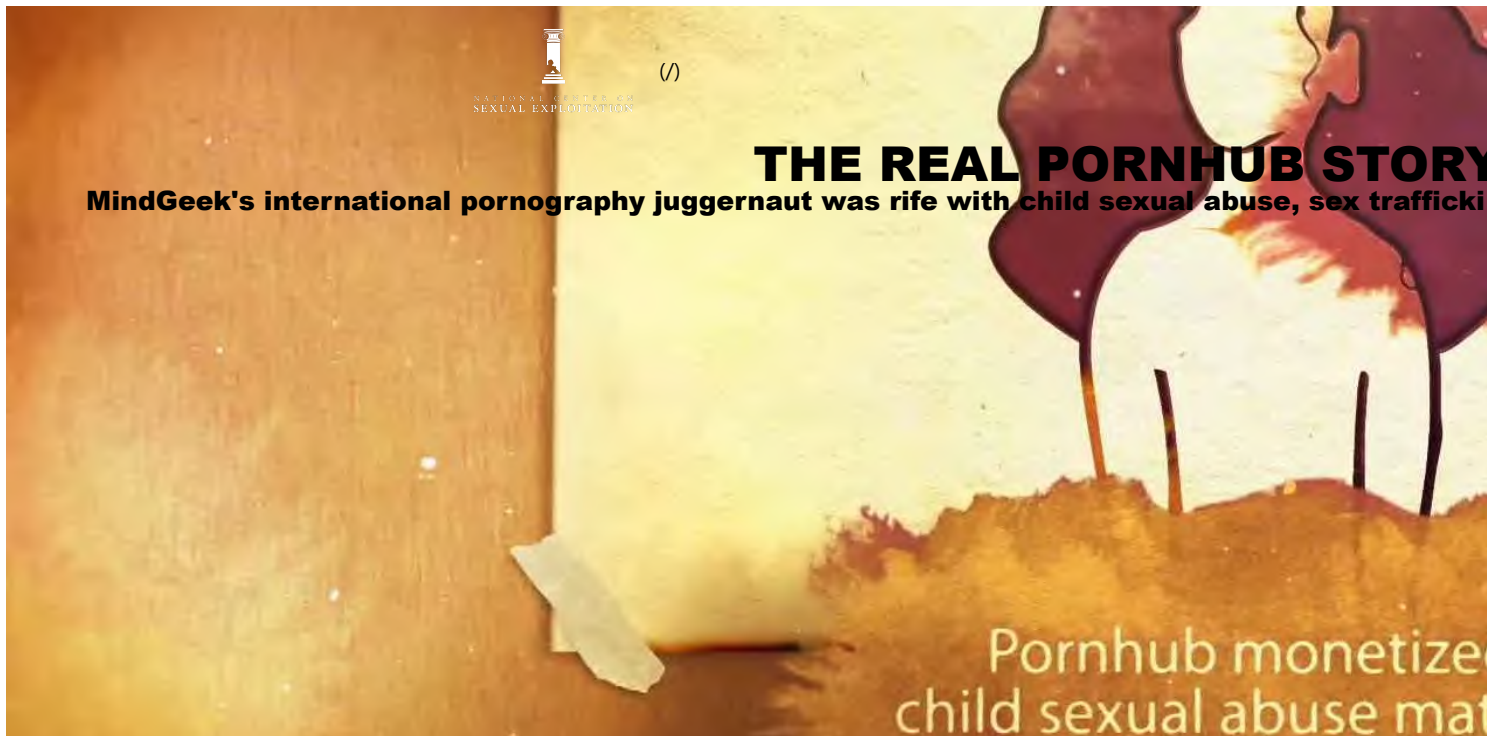
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Q SEARCH...



Dani Pinter, from NCOSE's Law Center, was recently featured in the Netflix documentary *Moneyshot: The Pornhub Story*. Read below to learn more about cases of exploitation, justice for survivors, and policy solutions.

Pornhub has profited off the sexual abuse of women,
children, and men. Now, survivors are stepping forward
and seeking justice.
Do you stand with them?

VICTORIES

When we work together to shine a light on the exploitation and abuse
happening on platforms like Pornhub, corporations like Mastercard and Roku
will take action.

These corporations all cut ties to Pornhub thanks to efforts like the
#DismantlePornhub campaign



THE FACTS

EVIDENCE OF PORNHUB'S...

ABUSE

- Pornhub hosted and monetized nonconsensually recorded videos of women's sports team (<https://endsexualexploitation.org/articles/female-students-secretly-filmed-in-a-locker-room/>)
 - Pornhub hosted and monetized material featuring sex trafficking victims (<https://endsexualexploitation.org/articles/girls-do-porn-trafficking-not-anomaly-porn-industry/>)
 - Pornhub hosted material of minor being raped by family member (<https://www.thesun.co.uk/news/10791614/teacher-50-who-filmed-herself-sex-with-teen-girl-relative-and-uploaded-it-to-pornhub-is-jailed-for-almost-7-years/amp/>)
 - Pornhub featured women being brutally abused (<https://metro.co.uk/2020/02/25/pornhub-women-brutally-abused-shut-12293100/>)
 - Pornhub hosted a sexual abuse video of a 12-year-old child which was viewed hundreds of thousands of times (<https://www.al.com/news/2022/11/alabama-mother-sues-pornhub-parent-company-over-video-of-12-year-old-being-molested.html>)
- Child rapes,
revenge
pornography,
spy cam

- videos of women showering, racist and misogynist content (New York Times) (<https://www.nytimes.com/2020/12/04/opinion/sunday/pornhub-rape-trafficking.html>)

EXPLOITATION

- Pornhub hosted and profited from racist material (<https://endsexualexploitation.org/articles/pornhubs-darkly-ironic-claims-about-racism-and-social-injustice/>)
- Pornhub hosts advertisements and referral links for deepfake pornography sites with nonconsensual deepfake depictions of people (<https://kotaku.com/deepfake-atriloc-twitch-streamer-apology-legal-action-1850055762>)
- Pornhub hosted content encouraging and normalizing sex with teens (<https://endsexualexploitation.org/articles/research-spotlight/sexual-violence-as-a-sexual-script-in-pornography/>)

PREDATORY BUSINESS MODEL

- Porn Didn't Suffer from a 'Piracy Problem,' It Actively Relied on It (<https://www.vice.com/en/article/kz4899/free-youporn-redtube-pornhub-piracy-alessa-savage-ukcutegirl>)
- Pornhub's owner had more user data than Netflix or Hulu, here's why (<https://qz.com/1407235/porn-sites-collect-more-user-data-than-netflix-or-hulu-this-is-what-they-do-with-it/>)
- Pornhub used "pornified" philanthropy to redirect attention away from its business (<https://endsexualexploitation.org/articles/the-pornography-industrys-aggressive-marketing-tactics-explained/>)



(<https://sexualexploitationlawsuits.com/get-help/pornhub/>)



(<https://www.sextradesurvivorresources.com/>)

You can make a difference in two tangible ways TODAY:



(<https://endsexualexploitation.org/donate-the-real-pornhub-story/>)

**Donate to support the Law Center as it launches lawsuits
and helps survivors**

(<https://endsexualexploitation.org/donate-the-real-pornhub-story/>)

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Sign Petition below calling for common sense solutions

(Scroll down to add your name below)



NATIONAL CENTER ON SEXUAL EXPLOITATION
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Verifying Age And Consent Cannot Be Optional

Child sexual abuse materials (i.e. child pornography), sex trafficking and rape videos and other for based sexual abuse have proliferated on [Pornhub](https://www.nytimes.com/2020/12/04/opinion/sunday/pornhub-rape-trafficking.html?eType=ActivityDefinitionInstance&eld=c9479834-2518-4a70-9686-31e8180f60e5) (<https://www.nytimes.com/2020/12/04/opinion/sunday/pornhub-rape-trafficking.html?eType=ActivityDefinitionInstance&eld=c9479834-2518-4a70-9686-31e8180f60e5>), XVideos (<https://www.nytimes.com/2021/04/16/opinion/sunday/companies-online-rape-videos.html?eType=ActivityDefinitionInstance&eld=c9479834-2518-4a70-9686-31e8180f60e5>), and even R (<https://www.theverge.com/2021/4/25/22399306/reddit-lawsuit-child-sexual-abuse-material-section-230?eType=ActivityDefinitionInstance&eld=c9479834-2518-4a70-9686-31e8180f60e5>), (<https://ncose.salsalabs.org/twitter/index.html?eType=ActivityDefinitionInstance&eld=c9479834-9686-31e8180f60e5>). At times, Pornhub has even "verified" accounts posting child sexual abuse trafficking. This is unacceptable!

Sign this petition to call on ALL websites that disseminate pornography to verify the age and conse person depicted in videos on their platform – anything less than this is, at best, reckless facilitatio they cannot effectively and consistently employ these basic safety standards, they should not be p content!

Sign the Petition: All Pornography Websites Must Meaningfully Verify Age a
for Every Person Depicted On Their Platform

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Signatures

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Name: Gail Coverdale

Name: Calli Cain

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Name: Aleisha Hyland


Name: Daisy Hill

 (<https://www.facebook.com/centeronexploitation/>)

 (<https://www.twitter.com/ncose>)

 (<https://www.instagram.com/endexploitation/>)

 (<https://www.youtube.com/user/PornHarms>)

 (<https://www.linkedin.com/company/national-center-on-sexual->

LAWSUITS

Our Groundbreaking Lawsuit With Our Partners:



(/articles/

and-mindgeek-explained-2/)

Class Action Lawsuit - Trafficked Children (/articles/the-class-action-law-and-mindgeek-explained-2/)

The NCOSE Law Center is helping victims of Pornhub bring a class action lawsuit against MindGeek in ord

Learn More
(/articles/the-class-action-lawsuit-against-pornhub-and-mindgeek-expl:

Updates on other lawsuits and legal battles:



(<https://www.cnn.com/2021/06/17/tech/pornhub-lawsuit-filed/index.html>)

Pornhub Sued for Allegedly Serving Nonconsensual Sex
(<https://www.cnn.com/2021/06/17/tech/pornhub-law-filed/index.html>)



(<https://ca.topclassactions.com/lawsuit-settlements/lawsuit-news/mindgeek-class-action-raises-questions-about-consent/>)

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(<https://www.bbc.com/news/technology-55333403>)

Pornhub Sued by 40 Girls Do Porn Sex Trafficking Victim
(<https://www.bbc.com/news/technology-55333403>)



(<https://globalnews.ca/news/7565362/class-action-lawsuit-quebec-pornhub-mindgeek/>)

Class-action lawsuit filed in Quebec against Pornhub parent company (<https://globalnews.ca/news/7565362/class-action-lawsuit-quebec-pornhub-mindgeek/>)

THE BIGGER PICTURE

THE 2023 NETFLIX DOCUMENTARY

The Netflix documentary Moneyshot: The Pornhub Story addressed multiple narratives around the popular pornography website Pornhub—but most importantly it shed light on cases of the harm from and facilitating sexual exploitation. [Content warning: this documentary includes nude references, language, sexual violence references.]

Dani Pinter, a lawyer with the NCOSE Law Center, was interviewed for the documentary.

A major take away from the documentary, that both NCOSE and most pornography performers agreed on, is the need for strict age and consent verification and improved moderation in the industry. You can [help join the call for this common-sense reform by signing this petition \(https://ncose.salsalabs.org/petitionageandconsent/index.html\)](https://ncose.salsalabs.org/petitionageandconsent/index.html).

NCOSE's goal is to create avenues of justice for survivors and bring accountability to sexual exploitation.

We wish to [walk alongside survivors \(https://endsexualexploitation.org/walking-alone\)](https://endsexualexploitation.org/walking-alone) elevate [resources \(https://sextradesurvivorresources.com/\)](https://sextradesurvivorresources.com/) and survivor voices, and to seek justice. NCOSE's Law Center files lawsuits on behalf of survivors, seeking monetary damages and accountability for those who profit from abuse. Learn more at <https://sexualexploitationlawsuits.com/>

IT GOES BEYOND JUST PORNHUB

Other pornography platforms like [OnlyFans \(https://endsexualexploitation.org/onlyfans\)](https://endsexualexploitation.org/onlyfans) and [XVideos \(https://endsexualexploitation.org/articles/the-xvideos-class-action-law-suit\)](https://endsexualexploitation.org/articles/the-xvideos-class-action-law-suit) even mainstream platforms like [Twitter \(https://endsexualexploitation.org/articles/sex-against-twitter-continues-on-appeal/\)](https://endsexualexploitation.org/articles/sex-against-twitter-continues-on-appeal/) and [Reddit \(https://endsexualexploitation.org/r\)](https://endsexualexploitation.org/r) have facilitated forms of child sexual abuse, sex trafficking, or image-based sexual abuse. We call for corporate responsibility throughout all online platforms to verify age and consent for people posting explicit content they host and/or profit from.

READ MORE:

- ▶ Pornhub's Abuse and Exploitation Go Far Beyond "Unverified" Material
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Appx000247

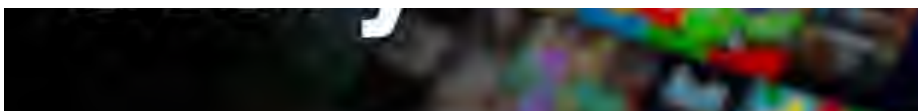


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improvements-from-2022/)

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(<https://endsexualexploitation.org/articles/statement-class-action-lawsuit-filed-against-pornhub-by-two-survivors-of-childhood-sex-trafficking/>)

Lawsuit Filed Against Pornhub
(<https://endsexualexploitation.org/articles/statement-class-action-lawsuit-filed-against-pornhub-by-two-survivors-of-childhood-sex-trafficking/>)

An accomplished assembly of survivor-focused and commercial litigation law firms have jointly filed a lawsuit against MindGeek, the parent company of Pornhub.



(<https://www.nytimes.com/2020/12/04/opinion/sunday/pornhub-rape-trafficking>).

The Children of Pornhub
(<https://www.nytimes.com/2020/12/04/opini rape-trafficking.html>)

Groundbreaking New York Times articling highlighting the experiences of numerous survivors and exploitation filmed and distributed on Pornhub.

SURVIVOR RESOURCES



(<https://www.sextradesurvivorre>



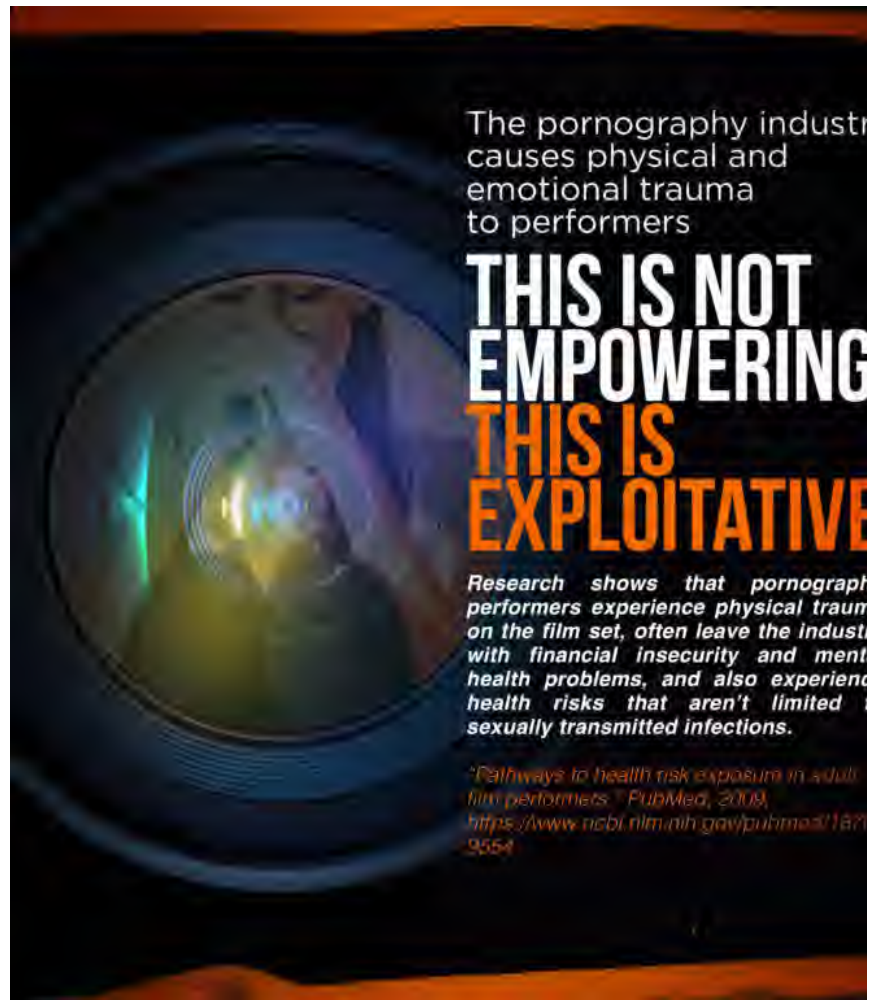
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CANADA

Class-action lawsuit filed in Quebec against Pornhub parent company

By Staff • The Canadian Press

Posted January 8, 2021 9:55 pm ▼



The Pornhub website is shown on a computer screen in Toronto on Wednesday, Dec. 16, 2020. A Class-action lawsuit has been filed in Quebec against Pornhub's parent company Mindgeek. Friday, Jan. 8, 2021. **THE CANADIAN PRESS**

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An Ontario resident has started a class-action lawsuit in Quebec against Pornhub's parent company MindGeek alleging it has profited off of child sexual abuse material and non-consensual content since 2007.

The case was brought by Siskinds, Desmeules Avocats, s.e.n.c.r.l. in collaboration with Sotos Class Actions.

It alleges that MindGeek illegally disseminated intimate videos and photos including depictions of child sexual abuse, sexual assault of adults, as well as intimate images of adults who did not consent to the public dissemination of their images.

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▶ Public safety minister says he reached out to RCMP to offer suppor...

The lawsuit, which requires court certification, is seeking hundreds of millions of dollars in compensation for people worldwide.

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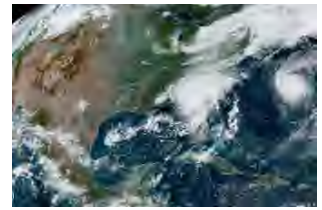
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MindGeek couldn't be immediately reached for comment and the lawsuit contains allegations that have not been proven in court.

The lawsuit follows one filed in December in California by **40 women who claim the Mont**real-based company knew or should have known that one of its commercial partners regularly used fraud and coercion to get women to appear in videos.

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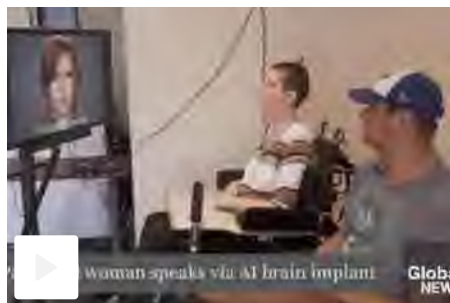
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August 2017

HTTP Live Streaming

Abstract

This document describes a protocol for transferring unbounded streams of multimedia data. It specifies the data format of the files and the actions to be taken by the server (sender) and the clients (receivers) of the streams. It describes version 7 of this protocol.

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1. Introduction to HTTP Live Streaming

HTTP Live Streaming provides a reliable, cost-effective means of delivering continuous and long-form video over the Internet. It allows a receiver to adapt the bit rate of the media to the current network conditions in order to maintain uninterrupted playback at the best possible quality. It supports interstitial content boundaries. It provides a flexible framework for media encryption. It can efficiently offer multiple renditions of the same content, such as audio translations. It offers compatibility with large-scale HTTP caching infrastructure to support delivery to large audiences.

Since the Internet-Draft was first posted in 2009, HTTP Live Streaming has been implemented and deployed by a wide array of content producers, tools vendors, distributors, and device manufacturers. In the subsequent eight years, the protocol has been refined by extensive review and discussion with a variety of media streaming implementors.

The purpose of this document is to facilitate interoperability between HTTP Live Streaming implementations by describing the media transmission protocol. Using this protocol, a client can receive a continuous stream of media from a server for concurrent presentation.

This document describes version 7 of the protocol.

2. Overview

A multimedia presentation is specified by a Uniform Resource Identifier (URI) [RFC3986] to a Playlist.

A Playlist is either a Media Playlist or a Master Playlist. Both are UTF-8 text files containing URIs and descriptive tags.

A Media Playlist contains a list of Media Segments, which, when played sequentially, will play the multimedia presentation.

Here is an example of a Media Playlist:

```
#EXTM3U
#EXT-X-TARGETDURATION:10

#EXTINF:9.009,
http://media.example.com/first.ts
#EXTINF:9.009,
http://media.example.com/second.ts
#EXTINF:3.003,
http://media.example.com/third.ts
```

The first line is the format identifier tag #EXTM3U. The line containing #EXT-X-TARGETDURATION says that all Media Segments will be 10 seconds long or less. Then, three Media Segments are declared. The first and second are 9.009 seconds long; the third is 3.003 seconds.

To play this Playlist, the client first downloads it and then downloads and plays each Media Segment declared within it. The client reloads the Playlist as described in this document to discover any added segments. Data SHOULD be carried over HTTP [RFC7230], but, in general, a URI can specify any protocol that can reliably transfer the specified resource on demand.

A more complex presentation can be described by a Master Playlist. A Master Playlist provides a set of Variant Streams, each of which describes a different version of the same content.

A Variant Stream includes a Media Playlist that specifies media encoded at a particular bit rate, in a particular format, and at a particular resolution for media containing video.

A Variant Stream can also specify a set of Renditions. Renditions are alternate versions of the content, such as audio produced in different languages or video recorded from different camera angles.

Clients should switch between different Variant Streams to adapt to network conditions. Clients should choose Renditions based on user preferences.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Media Segments

A Media Playlist contains a series of Media Segments that make up the overall presentation. A Media Segment is specified by a URI and optionally a byte range.

The duration of each Media Segment is indicated in the Media Playlist by its EXTINF tag (Section 4.3.2.1).

Each segment in a Media Playlist has a unique integer Media Sequence Number. The Media Sequence Number of the first segment in the Media Playlist is either 0 or declared in the Playlist (Section 4.3.3.2). The Media Sequence Number of every other segment is equal to the Media Sequence Number of the segment that precedes it plus one.

Each Media Segment MUST carry the continuation of the encoded bitstream from the end of the segment with the previous Media Sequence Number, where values in a series such as timestamps and Continuity Counters MUST continue uninterrupted. The only exceptions are the first Media Segment ever to appear in a Media Playlist and Media Segments that are explicitly signaled as discontinuities (Section 4.3.2.3). Unmarked media discontinuities can trigger playback errors.

Any Media Segment that contains video SHOULD include enough information to initialize a video decoder and decode a continuous set of frames that includes the final frame in the Segment; network efficiency is optimized if there is enough information in the Segment to decode all frames in the Segment. For example, any Media Segment containing H.264 video SHOULD contain an Instantaneous Decoding Refresh (IDR); frames prior to the first IDR will be downloaded but possibly discarded.

3.1. Supported Media Segment Formats

All Media Segments MUST be in a format described in this section. Transport of other media file formats is not defined.

Some media formats require a common sequence of bytes to initialize a parser before a Media Segment can be parsed. This format-specific sequence is called the Media Initialization Section. The Media Initialization Section can be specified by an EXT-X-MAP tag (Section 4.3.2.5). The Media Initialization Section MUST NOT contain sample data.

3.2. MPEG-2 Transport Streams

MPEG-2 Transport Streams are specified by [ISO_13818].

The Media Initialization Section of an MPEG-2 Transport Stream Segment is a Program Association Table (PAT) followed by a Program Map Table (PMT).

Transport Stream Segments MUST contain a single MPEG-2 Program; playback of Multi-Program Transport Streams is not defined. Each Transport Stream Segment MUST contain a PAT and a PMT, or have an EXT-X-MAP tag (Section 4.3.2.5) applied to it. The first two Transport Stream packets in a Segment without an EXT-X-MAP tag SHOULD be a PAT and a PMT.

3.3. Fragmented MPEG-4

MPEG-4 Fragments are specified by the ISO Base Media File Format [ISOBMFF]. Unlike regular MPEG-4 files that have a Movie Box ('moov') that contains sample tables and a Media Data Box ('mdat') containing the corresponding samples, an MPEG-4 Fragment consists of a Movie Fragment Box ('moof') containing a subset of the sample table and a Media Data Box containing those samples. Use of MPEG-4 Fragments does require a Movie Box for initialization, but that Movie Box contains only non-sample-specific information such as track and sample descriptions.

A Fragmented MPEG-4 (fMP4) Segment is a "segment" as defined by Section 3 of [ISOBMFF], including the constraints on Media Data Boxes in Section 8.16 of [ISOBMFF].

The Media Initialization Section for an fMP4 Segment is an ISO Base Media File that can initialize a parser for that Segment.

Broadly speaking, fMP4 Segments and Media Initialization Sections are [ISOBMFF] files that also satisfy the constraints described in this section.

The Media Initialization Section for an fMP4 Segment MUST contain a File Type Box ('ftyp') containing a brand that is compatible with 'iso6' or higher. The File Type Box MUST be followed by a Movie Box. The Movie Box MUST contain a Track Box ('trak') for every Track Fragment Box ('traf') in the fMP4 Segment, with matching track_ID. Each Track Box SHOULD contain a sample table, but its sample count MUST be zero. Movie Header Boxes ('mvhd') and Track Header Boxes ('tkhd') MUST have durations of zero. A Movie Extends Box ('mvex') MUST follow the last Track Box. Note that a Common Media Application Format (CMAF) Header [CMAF] meets all these requirements.

In an fMP4 Segment, every Track Fragment Box MUST contain a Track Fragment Decode Time Box ('tfdt'). fMP4 Segments MUST use movie-fragment-relative addressing. fMP4 Segments MUST NOT use external data references. Note that a CMAF Segment meets these requirements.

An fMP4 Segment in a Playlist containing the EXT-X-I-FRAMES-ONLY tag (Section 4.3.3.6) MAY omit the portion of the Media Data Box following the intra-coded frame (I-frame) sample data.

Each fMP4 Segment in a Media Playlist MUST have an EXT-X-MAP tag applied to it.

3.4. Packed Audio

A Packed Audio Segment contains encoded audio samples and ID3 tags that are simply packed together with minimal framing and no per-sample timestamps. Supported Packed Audio formats are Advanced Audio Coding (AAC) with Audio Data Transport Stream (ADTS) framing [ISO_13818_7], MP3 [ISO_13818_3], AC-3 [AC_3], and Enhanced AC-3 [AC_3].

A Packed Audio Segment has no Media Initialization Section.

Each Packed Audio Segment MUST signal the timestamp of its first sample with an ID3 Private frame (PRIV) tag [ID3] at the beginning of the segment. The ID3 PRIV owner identifier MUST be "com.apple.streaming.transportStreamTimestamp". The ID3 payload MUST be a 33-bit MPEG-2 Program Elementary Stream timestamp expressed as a big-endian eight-octet number, with the upper 31 bits set to zero. Clients SHOULD NOT play Packed Audio Segments without this ID3 tag.

3.5. WebVTT

A WebVTT Segment is a section of a WebVTT [WebVTT] file. WebVTT Segments carry subtitles.

The Media Initialization Section of a WebVTT Segment is the WebVTT header.

Each WebVTT Segment MUST contain all subtitle cues that are intended to be displayed during the period indicated by the segment EXTINF duration. The start time offset and end time offset of each cue MUST indicate the total display time for that cue, even if part of the cue time range is outside the Segment period. A WebVTT Segment MAY contain no cues; this indicates that no subtitles are to be displayed during that period.

Each WebVTT Segment MUST either start with a WebVTT header or have an EXT-X-MAP tag applied to it.

In order to synchronize timestamps between audio/video and subtitles, an X-TIMESTAMP-MAP metadata header SHOULD be added to each WebVTT header. This header maps WebVTT cue timestamps to MPEG-2 (PES) timestamps in other Renditions of the Variant Stream. Its format is:

```
X-TIMESTAMP-MAP=LOCAL:<cue time>,MPEGTS:<MPEG-2 time>
e.g., X-TIMESTAMP-MAP=LOCAL:00:00:00.000,MPEGTS:900000
```

The cue timestamp in the LOCAL attribute MAY fall outside the range of time covered by the segment.

If a WebVTT segment does not have the X-TIMESTAMP-MAP, the client MUST assume that the WebVTT cue time of 0 maps to an MPEG-2 timestamp of 0.

When synchronizing WebVTT with PES timestamps, clients SHOULD account for cases where the 33-bit PES timestamps have wrapped and the WebVTT cue times have not.

4. Playlists

This section describes the Playlist files used by HTTP Live Streaming. In this section, "MUST" and "MUST NOT" specify the rules for the syntax and structure of legal Playlist files. Playlists that violate these rules are invalid; clients MUST fail to parse them. See Section 6.3.2.

The format of the Playlist files is derived from the M3U [M3U] playlist file format and inherits two tags from that earlier file format: EXTM3U (Section 4.3.1.1) and EXTINF (Section 4.3.2.1).

In the specification of tag syntax, a string enclosed by <> identifies a tag parameter; its specific format is described in its tag definition. If a parameter is further surrounded by [], it is optional; otherwise, it is required.

Each Playlist file MUST be identifiable either by the path component of its URI or by HTTP Content-Type. In the first case, the path MUST end with either .m3u8 or .m3u. In the second, the HTTP Content-Type MUST be "application/vnd.apple.mpegurl" or "audio/mpegurl". Clients SHOULD refuse to parse Playlists that are not so identified.

4.1. Definition of a Playlist

Playlist files MUST be encoded in UTF-8 [RFC3629]. They MUST NOT contain any Byte Order Mark (BOM); clients SHOULD fail to parse Playlists that contain a BOM or do not parse as UTF-8. Playlist files MUST NOT contain UTF-8 control characters (U+0000 to U+001F and U+007F to U+009F), with the exceptions of CR (U+000D) and LF (U+000A). All character sequences MUST be normalized according to Unicode normalization form "NFC" [UNICODE]. Note that US-ASCII [US_ASCII] conforms to these rules.

Lines in a Playlist file are terminated by either a single line feed character or a carriage return character followed by a line feed character. Each line is a URI, is blank, or starts with the character '#'. Blank lines are ignored. Whitespace MUST NOT be present, except for elements in which it is explicitly specified.

Lines that start with the character '#' are either comments or tags. Tags begin with #EXT. They are case sensitive. All other lines that begin with '#' are comments and SHOULD be ignored.

A URI line identifies a Media Segment or a Playlist file (see Section 4.3.4.2). Each Media Segment is specified by a URI and the tags that apply to it.

A Playlist is a Media Playlist if all URI lines in the Playlist identify Media Segments. A Playlist is a Master Playlist if all URI lines in the Playlist identify Media Playlists. A Playlist MUST be either a Media Playlist or a Master Playlist; all other Playlists are invalid.

A URI in a Playlist, whether it is a URI line or part of a tag, MAY be relative. Any relative URI is considered to be relative to the URI of the Playlist that contains it.

The duration of a Media Playlist is the sum of the durations of the Media Segments within it.

The segment bit rate of a Media Segment is the size of the Media Segment divided by its EXTINF duration (Section 4.3.2.1). Note that this includes container overhead but does not include overhead imposed by the delivery system, such as HTTP, TCP, or IP headers.

The peak segment bit rate of a Media Playlist is the largest bit rate of any contiguous set of segments whose total duration is between 0.5 and 1.5 times the target duration. The bit rate of a set is calculated by dividing the sum of the segment sizes by the sum of the segment durations.

The average segment bit rate of a Media Playlist is the sum of the sizes (in bits) of every Media Segment in the Media Playlist, divided by the Media Playlist duration. Note that this includes container overhead, but not HTTP or other overhead imposed by the delivery system.

4.2. Attribute Lists

Certain tags have values that are attribute-lists. An attribute-list is a comma-separated list of attribute/value pairs with no whitespace.

An attribute/value pair has the following syntax:

AttributeName=AttributeValue

An AttributeName is an unquoted string containing characters from the set [A..Z], [0..9] and '-'. Therefore, AttributeNames contain only uppercase letters, not lowercase. There MUST NOT be any whitespace between the AttributeName and the '=' character, nor between the '=' character and the AttributeValue.

An AttributeValue is one of the following:

- o decimal-integer: an unquoted string of characters from the set [0..9] expressing an integer in base-10 arithmetic in the range from 0 to $2^{64}-1$ (18446744073709551615). A decimal-integer may be from 1 to 20 characters long.
- o hexadecimal-sequence: an unquoted string of characters from the set [0..9] and [A..F] that is prefixed with 0x or 0X. The maximum length of a hexadecimal-sequence depends on its AttributeNames.
- o decimal-floating-point: an unquoted string of characters from the set [0..9] and '.' that expresses a non-negative floating-point number in decimal positional notation.
- o signed-decimal-floating-point: an unquoted string of characters from the set [0..9], '-', and '.' that expresses a signed floating-point number in decimal positional notation.
- o quoted-string: a string of characters within a pair of double quotes (0x22). The following characters MUST NOT appear in a quoted-string: line feed (0xA), carriage return (0xD), or double quote (0x22). Quoted-string AttributeValues SHOULD be constructed so that byte-wise comparison is sufficient to test two quoted-string AttributeValues for equality. Note that this implies case-sensitive comparison.

- o enumerated-string: an unquoted character string from a set that is explicitly defined by the AttributeName. An enumerated-string will never contain double quotes ("), commas (,), or whitespace.
- o decimal-resolution: two decimal-integers separated by the "x" character. The first integer is a horizontal pixel dimension (width); the second is a vertical pixel dimension (height).

The type of the AttributeValue for a given AttributeName is specified by the attribute definition.

A given AttributeName MUST NOT appear more than once in a given attribute-list. Clients SHOULD refuse to parse such Playlists.

4.3. Playlist Tags

Playlist tags specify either global parameters of the Playlist or information about the Media Segments or Media Playlists that appear after them.

4.3.1. Basic Tags

These tags are allowed in both Media Playlists and Master Playlists.

4.3.1.1. EXTM3U

The EXTM3U tag indicates that the file is an Extended M3U [M3U] Playlist file. It MUST be the first line of every Media Playlist and every Master Playlist. Its format is:

```
#EXTM3U
```

4.3.1.2. EXT-X-VERSION

The EXT-X-VERSION tag indicates the compatibility version of the Playlist file, its associated media, and its server.

The EXT-X-VERSION tag applies to the entire Playlist file. Its format is:

```
#EXT-X-VERSION:<n>
```

where n is an integer indicating the protocol compatibility version number.

It MUST appear in all Playlists containing tags or attributes that are not compatible with protocol version 1 to support interoperability with older clients. Section 7 specifies the minimum value of the compatibility version number for any given Playlist file.

A Playlist file MUST NOT contain more than one EXT-X-VERSION tag. If a client encounters a Playlist with multiple EXT-X-VERSION tags, it MUST fail to parse it.

4.3.2. Media Segment Tags

Each Media Segment is specified by a series of Media Segment tags followed by a URI. Some Media Segment tags apply to just the next segment; others apply to all subsequent segments until another instance of the same tag.

A Media Segment tag MUST NOT appear in a Master Playlist. Clients MUST fail to parse Playlists that contain both Media Segment tags and Master Playlist tags (Section 4.3.4).

4.3.2.1. EXTINF

The EXTINF tag specifies the duration of a Media Segment. It applies only to the next Media Segment. This tag is REQUIRED for each Media Segment. Its format is:

```
#EXTINF:<duration>,[<title>]
```

where duration is a decimal-floating-point or decimal-integer number (as described in Section 4.2) that specifies the duration of the Media Segment in seconds. Durations SHOULD be decimal-floating-point, with enough accuracy to avoid perceptible error when segment durations are accumulated. However, if the compatibility version number is less than 3, durations MUST be integers. Durations that are reported as integers SHOULD be rounded to the nearest integer. The remainder of the line following the comma is an optional human-readable informative title of the Media Segment expressed as UTF-8 text.

4.3.2.2. EXT-X-BYTERANGE

The EXT-X-BYTERANGE tag indicates that a Media Segment is a sub-range of the resource identified by its URI. It applies only to the next URI line that follows it in the Playlist. Its format is:

```
#EXT-X-BYTERANGE:<n>[@<o>]
```

where n is a decimal-integer indicating the length of the sub-range in bytes. If present, o is a decimal-integer indicating the start of the sub-range, as a byte offset from the beginning of the resource. If o is not present, the sub-range begins at the next byte following the sub-range of the previous Media Segment.

If o is not present, a previous Media Segment MUST appear in the Playlist file and MUST be a sub-range of the same media resource, or the Media Segment is undefined and the client MUST fail to parse the Playlist.

A Media Segment without an EXT-X-BYTERANGE tag consists of the entire resource identified by its URI.

Use of the EXT-X-BYTERANGE tag REQUIRES a compatibility version number of 4 or greater.

4.3.2.3. EXT-X-DISCONTINUITY

The EXT-X-DISCONTINUITY tag indicates a discontinuity between the Media Segment that follows it and the one that preceded it.

Its format is:

```
#EXT-X-DISCONTINUITY
```

The EXT-X-DISCONTINUITY tag MUST be present if there is a change in any of the following characteristics:

- o file format
- o number, type, and identifiers of tracks
- o timestamp sequence

The EXT-X-DISCONTINUITY tag SHOULD be present if there is a change in any of the following characteristics:

- o encoding parameters
- o encoding sequence

See Sections 3, 6.2.1, and 6.3.3 for more information about the EXT-X-DISCONTINUITY tag.

4.3.2.4. EXT-X-KEY

Media Segments MAY be encrypted. The EXT-X-KEY tag specifies how to decrypt them. It applies to every Media Segment and to every Media Initialization Section declared by an EXT-X-MAP tag that appears between it and the next EXT-X-KEY tag in the Playlist file with the same KEYFORMAT attribute (or the end of the Playlist file). Two or more EXT-X-KEY tags with different KEYFORMAT attributes MAY apply to the same Media Segment if they ultimately produce the same decryption key. The format is:

```
#EXT-X-KEY:<attribute-list>
```

The following attributes are defined:

METHOD

The value is an enumerated-string that specifies the encryption method. This attribute is REQUIRED.

The methods defined are: NONE, AES-128, and SAMPLE-AES.

An encryption method of NONE means that Media Segments are not encrypted. If the encryption method is NONE, other attributes MUST NOT be present.

An encryption method of AES-128 signals that Media Segments are completely encrypted using the Advanced Encryption Standard (AES) [AES_128] with a 128-bit key, Cipher Block Chaining (CBC), and Public-Key Cryptography Standards #7 (PKCS7) padding [RFC5652]. CBC is restarted on each segment boundary, using either the Initialization Vector (IV) attribute value or the Media Sequence Number as the IV; see Section 5.2.

An encryption method of SAMPLE-AES means that the Media Segments contain media samples, such as audio or video, that are encrypted using the Advanced Encryption Standard [AES_128]. How these media streams are encrypted and encapsulated in a segment depends on the

media encoding and the media format of the segment. fMP4 Media Segments are encrypted using the 'cbcs' scheme of Common Encryption [COMMON_ENC]. Encryption of other Media Segment formats containing H.264 [H_264], AAC [ISO_14496], AC-3 [AC_3], and Enhanced AC-3 [AC_3] media streams is described in the HTTP Live Streaming (HLS) Sample Encryption specification [SampleEnc]. The IV attribute MAY be present; see Section 5.2.

URI

The value is a quoted-string containing a URI that specifies how to obtain the key. This attribute is REQUIRED unless the METHOD is NONE.

IV

The value is a hexadecimal-sequence that specifies a 128-bit unsigned integer Initialization Vector to be used with the key. Use of the IV attribute REQUIRES a compatibility version number of 2 or greater. See Section 5.2 for when the IV attribute is used.

KEYFORMAT

The value is a quoted-string that specifies how the key is represented in the resource identified by the URI; see Section 5 for more detail. This attribute is OPTIONAL; its absence indicates an implicit value of "identity". Use of the KEYFORMAT attribute REQUIRES a compatibility version number of 5 or greater.

KEYFORMATVERSIONS

The value is a quoted-string containing one or more positive integers separated by the "/" character (for example, "1", "1/2", or "1/2/5"). If more than one version of a particular KEYFORMAT is defined, this attribute can be used to indicate which version(s) this instance complies with. This attribute is OPTIONAL; if it is not present, its value is considered to be "1". Use of the KEYFORMATVERSIONS attribute REQUIRES a compatibility version number of 5 or greater.

If the Media Playlist file does not contain an EXT-X-KEY tag, then Media Segments are not encrypted.

See Section 5 for the format of the Key file and Sections 5.2, 6.2.3, and 6.3.6 for additional information on Media Segment encryption.

4.3.2.5. EXT-X-MAP

The EXT-X-MAP tag specifies how to obtain the Media Initialization Section (Section 3) required to parse the applicable Media Segments. It applies to every Media Segment that appears after it in the Playlist until the next EXT-X-MAP tag or until the end of the Playlist.

Its format is:

```
#EXT-X-MAP:<attribute-list>
```

The following attributes are defined:

URI

The value is a quoted-string containing a URI that identifies a resource that contains the Media Initialization Section. This attribute is REQUIRED.

BYTERANGE

The value is a quoted-string specifying a byte range into the resource identified by the URI attribute. This range SHOULD contain only the Media Initialization Section. The format of the byte range is described in Section 4.3.2.2. This attribute is OPTIONAL; if it is not present, the byte range is the entire resource indicated by the URI.

An EXT-X-MAP tag SHOULD be supplied for Media Segments in Playlists with the EXT-X-I-FRAMES-ONLY tag when the first Media Segment (i.e., I-frame) in the Playlist (or the first segment following an EXT-X-DISCONTINUITY tag) does not immediately follow the Media Initialization Section at the beginning of its resource.

Use of the EXT-X-MAP tag in a Media Playlist that contains the EXT-X-I-FRAMES-ONLY tag REQUIRES a compatibility version number of 5 or greater. Use of the EXT-X-MAP tag in a Media Playlist that DOES NOT contain the EXT-X-I-FRAMES-ONLY tag REQUIRES a compatibility version number of 6 or greater.

If the Media Initialization Section declared by an EXT-X-MAP tag is encrypted with a METHOD of AES-128, the IV attribute of the EXT-X-KEY tag that applies to the EXT-X-MAP is REQUIRED.

4.3.2.6. EXT-X-PROGRAM-DATE-TIME

The EXT-X-PROGRAM-DATE-TIME tag associates the first sample of a Media Segment with an absolute date and/or time. It applies only to the next Media Segment. Its format is:

```
#EXT-X-PROGRAM-DATE-TIME:<date-time-msec>
```

where date-time-msec is an ISO/IEC 8601:2004 [ISO_8601] date/time representation, such as YYYY-MM-DDThh:mm:ss.SSSZ. It SHOULD indicate a time zone and fractional parts of seconds, to millisecond accuracy.

For example:

```
#EXT-X-PROGRAM-DATE-TIME:2010-02-19T14:54:23.031+08:00
```

See Sections 6.2.1 and 6.3.3 for more information on the EXT-X-PROGRAM-DATE-TIME tag.

4.3.2.7. EXT-X-DATERANGE

The EXT-X-DATERANGE tag associates a Date Range (i.e., a range of time defined by a starting and ending date) with a set of attribute/value pairs. Its format is:

```
#EXT-X-DATERANGE:<attribute-list>
```

where the defined attributes are:

ID

A quoted-string that uniquely identifies a Date Range in the Playlist. This attribute is REQUIRED.

CLASS

A client-defined quoted-string that specifies some set of attributes and their associated value semantics. All Date Ranges with the same CLASS attribute value MUST adhere to these semantics. This attribute is OPTIONAL.

START-DATE

A quoted-string containing the ISO-8601 date at which the Date Range begins. This attribute is REQUIRED.

END-DATE

A quoted-string containing the ISO-8601 date at which the Date Range ends. It MUST be equal to or later than the value of the START-DATE attribute. This attribute is OPTIONAL.

DURATION

The duration of the Date Range expressed as a decimal-floating-point number of seconds. It MUST NOT be negative. A single instant in time (e.g., crossing a finish line) SHOULD be represented with a duration of 0. This attribute is OPTIONAL.

PLANNED-DURATION

The expected duration of the Date Range expressed as a decimal-floating-point number of seconds. It MUST NOT be negative. This attribute SHOULD be used to indicate the expected duration of a Date Range whose actual duration is not yet known. It is OPTIONAL.

X-<client-attribute>

The "X-" prefix defines a namespace reserved for client-defined attributes. The client-attribute MUST be a legal AttributeName. Clients SHOULD use a reverse-DNS syntax when defining their own attribute names to avoid collisions. The attribute value MUST be a quoted-string, a hexadecimal-sequence, or a decimal-floating-point. An example of a client-defined attribute is X-COM-EXAMPLE-AD-ID="XYZ123". These attributes are OPTIONAL.

SCTE35-CMD, SCTE35-OUT, SCTE35-IN

Used to carry SCTE-35 data; see Section 4.3.2.7.1 for more information. These attributes are OPTIONAL.

END-ON-NEXT

An enumerated-string whose value MUST be YES. This attribute indicates that the end of the range containing it is equal to the START-DATE of its Following Range. The Following Range is the Date Range of the same CLASS that has the earliest START-DATE after the START-DATE of the range in question. This attribute is OPTIONAL.

An EXT-X-DATERANGE tag with an END-ON-NEXT=YES attribute MUST have a CLASS attribute. Other EXT-X-DATERANGE tags with the same CLASS attribute MUST NOT specify Date Ranges that overlap.

An EXT-X-DATERANGE tag with an END-ON-NEXT=YES attribute MUST NOT contain DURATION or END-DATE attributes.

A Date Range with neither a DURATION, an END-DATE, nor an END-ON-NEXT=YES attribute has an unknown duration, even if it has a PLANNED-DURATION.

If a Playlist contains an EXT-X-DATERANGE tag, it MUST also contain at least one EXT-X-PROGRAM-DATE-TIME tag.

If a Playlist contains two EXT-X-DATERANGE tags with the same ID attribute value, then any AttributeName that appears in both tags MUST have the same AttributeValue.

If a Date Range contains both a DURATION attribute and an END-DATE attribute, the value of the END-DATE attribute MUST be equal to the value of the START-DATE attribute plus the value of the DURATION attribute.

Clients SHOULD ignore EXT-X-DATERANGE tags with illegal syntax.

4.3.2.7.1. Mapping SCTE-35 into EXT-X-DATERANGE

Splice information carried in source media according to the SCTE-35 specification [SCTE35] MAY be represented in a Media Playlist using EXT-X-DATERANGE tags.

Each SCTE-35 splice_info_section() containing a splice_null(), splice_schedule(), bandwidth_reservation(), or private_cmd() SHOULD be represented by an EXT-X-DATERANGE tag with an SCTE35-CMD attribute whose value is the big-endian binary representation of the splice_info_section(), expressed as a hexadecimal-sequence.

An SCTE-35 splice out/in pair signaled by a pair of splice_insert() commands SHOULD be represented by one or more EXT-X-DATERANGE tags carrying the same ID attribute, which MUST be unique to that splice out/in pair. The "out" splice_info_section() (with out_of_network_indicator set to 1) MUST be placed in an SCTE35-OUT attribute, with the same formatting as SCTE35-CMD. The "in" splice_info_section() (with out_of_network_indicator set to 0) MUST be placed in an SCTE35-IN attribute, with the same formatting as SCTE35-CMD.

An SCTE-35 splice out/in pair signaled by a pair of time_signal() commands, each carrying a single segmentation_descriptor(), SHOULD be represented by one or more EXT-X-DATERANGE tags carrying the same ID attribute, which MUST be unique to that splice out/in pair. The

"out" splice_info_section() MUST be placed in an SCTE35-OUT attribute; the "in" splice_info_section() MUST be placed in an SCTE35-IN attribute.

Different types of segmentation, as indicated by the segmentation_type_id in the segmentation_descriptor(), SHOULD be represented by separate EXT-X-DATERANGE tags, even if two or more segmentation_descriptor()s arrive in the same splice_info_section(). In that case, each EXT-X-DATERANGE tag will have an SCTE35-OUT, SCTE35-IN, or SCTE35-CMD attribute whose value is the entire splice_info_section().

An SCTE-35 time_signal() command that does not signal a splice out or in point SHOULD be represented by an EXT-X-DATERANGE tag with an SCTE35-CMD attribute.

The START-DATE of an EXT-X-DATERANGE tag containing an SCTE35-OUT attribute MUST be the date and time that corresponds to the program time of that splice.

The START-DATE of an EXT-X-DATERANGE tag containing an SCTE35-CMD MUST be the date and time specified by the splice_time() in the command or the program time at which the command appeared in the source stream if the command does not specify a splice_time().

An EXT-X-DATERANGE tag containing an SCTE35-OUT attribute MAY contain a PLANNED-DURATION attribute. Its value MUST be the planned duration of the splice.

The DURATION of an EXT-X-DATERANGE tag containing an SCTE35-IN attribute MUST be the actual (not planned) program duration between the corresponding out-point and that in-point.

The END-DATE of an EXT-X-DATERANGE tag containing an SCTE35-IN attribute MUST be the actual (not planned) program date and time of that in-point.

If the actual end date and time is not known when an SCTE35-OUT attribute is added to the Playlist, the DURATION attribute and the END-TIME attribute MUST NOT be present; the actual end date of the splice SHOULD be signaled by another EXT-X-DATERANGE tag once it has been established.

A canceled splice SHOULD NOT appear in the Playlist as an EXT-X-DATERANGE tag.

An EXT-X-DATERANGE tag announcing a splice SHOULD be added to a Playlist at the same time as the last pre-splice Media Segment, or earlier if possible.

The ID attribute of an EXT-X-DATERANGE tag MAY contain a splice_event_id and/or a segmentation_event_id, but it MUST be unique in the Playlist. If there is a possibility that an SCTE-35 id will be reused, the ID attribute value MUST include disambiguation, such as a date or sequence number.

4.3.3. Media Playlist Tags

Media Playlist tags describe global parameters of the Media Playlist. There MUST NOT be more than one Media Playlist tag of each type in any Media Playlist.

A Media Playlist tag MUST NOT appear in a Master Playlist.

4.3.3.1. EXT-X-TARGETDURATION

The EXT-X-TARGETDURATION tag specifies the maximum Media Segment duration. The EXTINF duration of each Media Segment in the Playlist file, when rounded to the nearest integer, MUST be less than or equal to the target duration; longer segments can trigger playback stalls or other errors. It applies to the entire Playlist file. Its format is:

```
#EXT-X-TARGETDURATION:<s>
```

where s is a decimal-integer indicating the target duration in seconds. The EXT-X-TARGETDURATION tag is REQUIRED.

4.3.3.2. EXT-X-MEDIA-SEQUENCE

The EXT-X-MEDIA-SEQUENCE tag indicates the Media Sequence Number of the first Media Segment that appears in a Playlist file. Its format is:

```
#EXT-X-MEDIA-SEQUENCE:<number>
```

where number is a decimal-integer.

If the Media Playlist file does not contain an EXT-X-MEDIA-SEQUENCE tag, then the Media Sequence Number of the first Media Segment in the Media Playlist SHALL be considered to be 0. A client MUST NOT assume that segments with the same Media Sequence Number in different Media Playlists contain matching content (see Section 6.3.2).

A URI for a Media Segment is not required to contain its Media Sequence Number.

See Sections 6.2.1 and 6.3.5 for more information on setting the EXT-X-MEDIA-SEQUENCE tag.

The EXT-X-MEDIA-SEQUENCE tag MUST appear before the first Media Segment in the Playlist.

4.3.3.3. EXT-X-DISCONTINUITY-SEQUENCE

The EXT-X-DISCONTINUITY-SEQUENCE tag allows synchronization between different Renditions of the same Variant Stream or different Variant Streams that have EXT-X-DISCONTINUITY tags in their Media Playlists.

Its format is:

```
#EXT-X-DISCONTINUITY-SEQUENCE:<number>
```

where number is a decimal-integer.

If the Media Playlist does not contain an EXT-X-DISCONTINUITY-SEQUENCE tag, then the Discontinuity Sequence Number of the first Media Segment in the Playlist SHALL be considered to be 0.

The EXT-X-DISCONTINUITY-SEQUENCE tag MUST appear before the first Media Segment in the Playlist.

The EXT-X-DISCONTINUITY-SEQUENCE tag MUST appear before any EXT-X-DISCONTINUITY tag.

See Sections 6.2.1 and 6.2.2 for more information about setting the value of the EXT-X-DISCONTINUITY-SEQUENCE tag.

4.3.3.4. EXT-X-ENDLIST

The EXT-X-ENDLIST tag indicates that no more Media Segments will be added to the Media Playlist file. It MAY occur anywhere in the Media Playlist file. Its format is:

```
#EXT-X-ENDLIST
```

4.3.3.5. EXT-X-PLAYLIST-TYPE

The EXT-X-PLAYLIST-TYPE tag provides mutability information about the Media Playlist file. It applies to the entire Media Playlist file. It is OPTIONAL. Its format is:

```
#EXT-X-PLAYLIST-TYPE:<type-enum>
```

where type-enum is either EVENT or VOD.

Section 6.2.1 defines the implications of the EXT-X-PLAYLIST-TYPE tag.

If the EXT-X-PLAYLIST-TYPE value is EVENT, Media Segments can only be added to the end of the Media Playlist. If the EXT-X-PLAYLIST-TYPE value is Video On Demand (VOD), the Media Playlist cannot change.

If the EXT-X-PLAYLIST-TYPE tag is omitted from a Media Playlist, the Playlist can be updated according to the rules in Section 6.2.1 with no additional restrictions. For example, a live Playlist (Section 6.2.2) MAY be updated to remove Media Segments in the order that they appeared.

4.3.3.6. EXT-X-I-FRAMES-ONLY

The EXT-X-I-FRAMES-ONLY tag indicates that each Media Segment in the Playlist describes a single I-frame. I-frames are encoded video frames whose encoding does not depend on any other frame. I-frame Playlists can be used for trick play, such as fast forward, rapid reverse, and scrubbing.

The EXT-X-I-FRAMES-ONLY tag applies to the entire Playlist. Its format is:

```
#EXT-X-I-FRAMES-ONLY
```

In a Playlist with the EXT-X-I-FRAMES-ONLY tag, the Media Segment duration (EXTINF tag value) is the time between the presentation time of the I-frame in the Media Segment and the presentation time of the next I-frame in the Playlist, or the end of the presentation if it is the last I-frame in the Playlist.

Media resources containing I-frame segments MUST begin with either a Media Initialization Section (Section 3) or be accompanied by an EXT-X-MAP tag indicating the Media Initialization Section so that clients can load and decode I-frame segments in any order. The byte range of an I-frame segment with an EXT-X-BYTERANGE tag applied to it (Section 4.3.2.2) MUST NOT include its Media Initialization Section;

clients can assume that the Media Initialization Section is defined by the EXT-X-MAP tag or is located from the start of the resource to the offset of the first I-frame segment in that resource.

Use of the EXT-X-I-FRAMES-ONLY REQUIRES a compatibility version number of 4 or greater.

4.3.4. Master Playlist Tags

Master Playlist tags define the Variant Streams, Renditions, and other global parameters of the presentation.

Master Playlist tags MUST NOT appear in a Media Playlist; clients MUST fail to parse any Playlist that contains both a Master Playlist tag and either a Media Playlist tag or a Media Segment tag.

4.3.4.1. EXT-X-MEDIA

The EXT-X-MEDIA tag is used to relate Media Playlists that contain alternative Renditions (Section 4.3.4.2.1) of the same content. For example, three EXT-X-MEDIA tags can be used to identify audio-only Media Playlists that contain English, French, and Spanish Renditions of the same presentation. Or, two EXT-X-MEDIA tags can be used to identify video-only Media Playlists that show two different camera angles.

Its format is:

```
#EXT-X-MEDIA:<attribute-list>
```

The following attributes are defined:

TYPE

The value is an enumerated-string; valid strings are AUDIO, VIDEO, SUBTITLES, and CLOSED-CAPTIONS. This attribute is REQUIRED.

Typically, closed-caption [CEA608] media is carried in the video stream. Therefore, an EXT-X-MEDIA tag with TYPE of CLOSED-CAPTIONS does not specify a Rendition; the closed-caption media is present in the Media Segments of every video Rendition.

URI

The value is a quoted-string containing a URI that identifies the Media Playlist file. This attribute is OPTIONAL; see Section 4.3.4.2.1. If the TYPE is CLOSED-CAPTIONS, the URI attribute MUST NOT be present.

GROUP-ID

The value is a quoted-string that specifies the group to which the Rendition belongs. See Section 4.3.4.1.1. This attribute is REQUIRED.

LANGUAGE

The value is a quoted-string containing one of the standard Tags for Identifying Languages [RFC5646], which identifies the primary language used in the Rendition. This attribute is OPTIONAL.

ASSOC-LANGUAGE

The value is a quoted-string containing a language tag [RFC5646] that identifies a language that is associated with the Rendition. An associated language is often used in a different role than the language specified by the LANGUAGE attribute (e.g., written versus spoken or a fallback dialect). This attribute is OPTIONAL.

The LANGUAGE and ASSOC-LANGUAGE attributes can be used, for example, to link Norwegian Renditions that use different spoken and written languages.

NAME

The value is a quoted-string containing a human-readable description of the Rendition. If the LANGUAGE attribute is present, then this description SHOULD be in that language. This attribute is REQUIRED.

DEFAULT

The value is an enumerated-string; valid strings are YES and NO. If the value is YES, then the client SHOULD play this Rendition of the content in the absence of information from the user indicating a different choice. This attribute is OPTIONAL. Its absence indicates an implicit value of NO.

AUTOSELECT

The value is an enumerated-string; valid strings are YES and NO. This attribute is OPTIONAL. Its absence indicates an implicit value of NO. If the value is YES, then the client MAY choose to play this Rendition in the absence of explicit user preference because it matches the current playback environment, such as chosen system language.

If the AUTOSELECT attribute is present, its value MUST be YES if the value of the DEFAULT attribute is YES.

FORCED

The value is an enumerated-string; valid strings are YES and NO. This attribute is OPTIONAL. Its absence indicates an implicit value of NO. The FORCED attribute MUST NOT be present unless the TYPE is SUBTITLES.

A value of YES indicates that the Rendition contains content that is considered essential to play. When selecting a FORCED Rendition, a client SHOULD choose the one that best matches the current playback environment (e.g., language).

A value of NO indicates that the Rendition contains content that is intended to be played in response to explicit user request.

INSTREAM-ID

The value is a quoted-string that specifies a Rendition within the segments in the Media Playlist. This attribute is REQUIRED if the TYPE attribute is CLOSED-CAPTIONS, in which case it MUST have one of the values: "CC1", "CC2", "CC3", "CC4", or "SERVICE n " where n MUST be an integer between 1 and 63 (e.g., "SERVICE3" or "SERVICE42").

The values "CC1", "CC2", "CC3", and "CC4" identify a Line 21 Data Services channel [CEA608]. The "SERVICE" values identify a Digital Television Closed Captioning [CEA708] service block number.

For all other TYPE values, the INSTREAM-ID MUST NOT be specified.

CHARACTERISTICS

The value is a quoted-string containing one or more Uniform Type Identifiers [UTI] separated by comma (,) characters. This attribute is OPTIONAL. Each UTI indicates an individual characteristic of the Rendition.

A SUBTITLES Rendition MAY include the following characteristics: "public.accessibility.transcribes-spoken-dialog", "public.accessibility.describes-music-and-sound", and "public.easy-to-read" (which indicates that the subtitles have been edited for ease of reading).

An AUDIO Rendition MAY include the following characteristic:
 "public.accessibility.describes-video".

The CHARACTERISTICS attribute MAY include private UTIs.

CHANNELS

The value is a quoted-string that specifies an ordered, backslash-separated ("/") list of parameters. If the TYPE attribute is AUDIO, then the first parameter is a count of audio channels expressed as a decimal-integer, indicating the maximum number of independent, simultaneous audio channels present in any Media Segment in the Rendition. For example, an AC-3 5.1 Rendition would have a CHANNELS="6" attribute. No other CHANNELS parameters are currently defined.

All audio EXT-X-MEDIA tags SHOULD have a CHANNELS attribute. If a Master Playlist contains two Renditions encoded with the same codec but a different number of channels, then the CHANNELS attribute is REQUIRED; otherwise, it is OPTIONAL.

4.3.4.1.1. Rendition Groups

A set of one or more EXT-X-MEDIA tags with the same GROUP-ID value and the same TYPE value defines a Group of Renditions. Each member of the Group MUST be an alternative Rendition of the same content; otherwise, playback errors can occur.

All EXT-X-MEDIA tags in a Playlist MUST meet the following constraints:

- o All EXT-X-MEDIA tags in the same Group MUST have different NAME attributes.
- o A Group MUST NOT have more than one member with a DEFAULT attribute of YES.
- o Each EXT-X-MEDIA tag with an AUTOSELECT=YES attribute SHOULD have a combination of LANGUAGE [RFC5646], ASSOC-LANGUAGE, FORCED, and CHARACTERISTICS attributes that is distinct from those of other AUTOSELECT=YES members of its Group.

A Playlist MAY contain multiple Groups of the same TYPE in order to provide multiple encodings of that media type. If it does so, each Group of the same TYPE MUST have the same set of members, and each corresponding member MUST have identical attributes with the exception of the URI and CHANNELS attributes.

Each member in a Group of Renditions MAY have a different sample format. For example, an English Rendition can be encoded with AC-3 5.1 while a Spanish Rendition is encoded with AAC stereo. However, any EXT-X-STREAM-INF tag (Section 4.3.4.2) or EXT-X-I-FRAME-STREAM-INF tag (Section 4.3.4.3) that references such a Group MUST have a CODECS attribute that lists every sample format present in any Rendition in the Group, or client playback failures can occur. In the example above, the CODECS attribute would include "ac-3,mp4a.40.2".

4.3.4.2. EXT-X-STREAM-INF

The EXT-X-STREAM-INF tag specifies a Variant Stream, which is a set of Renditions that can be combined to play the presentation. The attributes of the tag provide information about the Variant Stream.

The URI line that follows the EXT-X-STREAM-INF tag specifies a Media Playlist that carries a Rendition of the Variant Stream. The URI line is REQUIRED. Clients that do not support multiple video Renditions SHOULD play this Rendition.

Its format is:

```
#EXT-X-STREAM-INF:<attribute-list>
<URI>
```

The following attributes are defined:

BANDWIDTH

The value is a decimal-integer of bits per second. It represents the peak segment bit rate of the Variant Stream.

If all the Media Segments in a Variant Stream have already been created, the BANDWIDTH value MUST be the largest sum of peak segment bit rates that is produced by any playable combination of Renditions. (For a Variant Stream with a single Media Playlist, this is just the peak segment bit rate of that Media Playlist.) An inaccurate value can cause playback stalls or prevent clients from playing the variant.

If the Master Playlist is to be made available before all Media Segments in the presentation have been encoded, the BANDWIDTH value SHOULD be the BANDWIDTH value of a representative period of similar content, encoded using the same settings.

Every EXT-X-STREAM-INF tag MUST include the BANDWIDTH attribute.

AVERAGE-BANDWIDTH

The value is a decimal-integer of bits per second. It represents the average segment bit rate of the Variant Stream.

If all the Media Segments in a Variant Stream have already been created, the AVERAGE-BANDWIDTH value MUST be the largest sum of average segment bit rates that is produced by any playable combination of Renditions. (For a Variant Stream with a single Media Playlist, this is just the average segment bit rate of that Media Playlist.) An inaccurate value can cause playback stalls or prevent clients from playing the variant.

If the Master Playlist is to be made available before all Media Segments in the presentation have been encoded, the AVERAGE-BANDWIDTH value SHOULD be the AVERAGE-BANDWIDTH value of a representative period of similar content, encoded using the same settings.

The AVERAGE-BANDWIDTH attribute is OPTIONAL.

CODECS

The value is a quoted-string containing a comma-separated list of formats, where each format specifies a media sample type that is present in one or more Renditions specified by the Variant Stream. Valid format identifiers are those in the ISO Base Media File Format Name Space defined by "The 'Codecs' and 'Profiles' Parameters for "Bucket" Media Types" [RFC6381].

For example, a stream containing AAC low complexity (AAC-LC) audio and H.264 Main Profile Level 3.0 video would have a CODECS value of "mp4a.40.2,avc1.4d401e".

Every EXT-X-STREAM-INF tag SHOULD include a CODECS attribute.

RESOLUTION

The value is a decimal-resolution describing the optimal pixel resolution at which to display all the video in the Variant Stream.

The RESOLUTION attribute is OPTIONAL but is recommended if the Variant Stream includes video.

FRAME-RATE

The value is a decimal-floating-point describing the maximum frame rate for all the video in the Variant Stream, rounded to three decimal places.

The FRAME-RATE attribute is OPTIONAL but is recommended if the Variant Stream includes video. The FRAME-RATE attribute SHOULD be included if any video in a Variant Stream exceeds 30 frames per second.

HDCP-LEVEL

The value is an enumerated-string; valid strings are TYPE-0 and NONE. This attribute is advisory; a value of TYPE-0 indicates that the Variant Stream could fail to play unless the output is protected by High-bandwidth Digital Content Protection (HDCP) Type 0 [HDCP] or equivalent. A value of NONE indicates that the content does not require output copy protection.

Encrypted Variant Streams with different HDCP levels SHOULD use different media encryption keys.

The HDCP-LEVEL attribute is OPTIONAL. It SHOULD be present if any content in the Variant Stream will fail to play without HDCP. Clients without output copy protection SHOULD NOT load a Variant Stream with an HDCP-LEVEL attribute unless its value is NONE.

AUDIO

The value is a quoted-string. It MUST match the value of the GROUP-ID attribute of an EXT-X-MEDIA tag elsewhere in the Master Playlist whose TYPE attribute is AUDIO. It indicates the set of audio Renditions that SHOULD be used when playing the presentation. See Section 4.3.4.2.1.

The AUDIO attribute is OPTIONAL.

VIDEO

The value is a quoted-string. It MUST match the value of the GROUP-ID attribute of an EXT-X-MEDIA tag elsewhere in the Master Playlist whose TYPE attribute is VIDEO. It indicates the set of video Renditions that SHOULD be used when playing the presentation. See Section 4.3.4.2.1.

The VIDEO attribute is OPTIONAL.

SUBTITLES

The value is a quoted-string. It MUST match the value of the GROUP-ID attribute of an EXT-X-MEDIA tag elsewhere in the Master Playlist whose TYPE attribute is SUBTITLES. It indicates the set of subtitle Renditions that can be used when playing the presentation. See Section 4.3.4.2.1.

The SUBTITLES attribute is OPTIONAL.

CLOSED-CAPTIONS

The value can be either a quoted-string or an enumerated-string with the value NONE. If the value is a quoted-string, it MUST match the value of the GROUP-ID attribute of an EXT-X-MEDIA tag elsewhere in the Playlist whose TYPE attribute is CLOSED-CAPTIONS, and it indicates the set of closed-caption Renditions that can be used when playing the presentation. See Section 4.3.4.2.1.

If the value is the enumerated-string value NONE, all EXT-X-STREAM-INF tags MUST have this attribute with a value of NONE, indicating that there are no closed captions in any Variant Stream in the Master Playlist. Having closed captions in one Variant Stream but not another can trigger playback inconsistencies.

The CLOSED-CAPTIONS attribute is OPTIONAL.

4.3.4.2.1. Alternative Renditions

When an EXT-X-STREAM-INF tag contains an AUDIO, VIDEO, SUBTITLES, or CLOSED-CAPTIONS attribute, it indicates that alternative Renditions of the content are available for playback of that Variant Stream.

When defining alternative Renditions, the following constraints MUST be met to prevent client playback errors:

- o All playable combinations of Renditions associated with an EXT-X-STREAM-INF tag MUST have an aggregate bandwidth less than or equal to the BANDWIDTH attribute of the EXT-X-STREAM-INF tag.
- o If an EXT-X-STREAM-INF tag contains a RESOLUTION attribute and a VIDEO attribute, then every alternative video Rendition MUST have an optimal display resolution matching the value of the RESOLUTION attribute.
- o Every alternative Rendition associated with an EXT-X-STREAM-INF tag MUST meet the constraints for a Variant Stream described in Section 6.2.4.

The URI attribute of the EXT-X-MEDIA tag is REQUIRED if the media type is SUBTITLES, but OPTIONAL if the media type is VIDEO or AUDIO. If the media type is VIDEO or AUDIO, a missing URI attribute indicates that the media data for this Rendition is included in the Media Playlist of any EXT-X-STREAM-INF tag referencing this EXT-X-MEDIA tag. If the media TYPE is AUDIO and the URI attribute is missing, clients MUST assume that the audio data for this Rendition is present in every video Rendition specified by the EXT-X-STREAM-INF tag.

The URI attribute of the EXT-X-MEDIA tag MUST NOT be included if the media type is CLOSED-CAPTIONS.

4.3.4.3. EXT-X-I-FRAME-STREAM-INF

The EXT-X-I-FRAME-STREAM-INF tag identifies a Media Playlist file containing the I-frames of a multimedia presentation. It stands alone, in that it does not apply to a particular URI in the Master Playlist. Its format is:

```
#EXT-X-I-FRAME-STREAM-INF:<attribute-list>
```

All attributes defined for the EXT-X-STREAM-INF tag (Section 4.3.4.2) are also defined for the EXT-X-I-FRAME-STREAM-INF tag, except for the FRAME-RATE, AUDIO, SUBTITLES, and CLOSED-CAPTIONS attributes. In addition, the following attribute is defined:

URI

The value is a quoted-string containing a URI that identifies the I-frame Media Playlist file. That Playlist file MUST contain an EXT-X-I-FRAMES-ONLY tag.

Every EXT-X-I-FRAME-STREAM-INF tag MUST include a BANDWIDTH attribute and a URI attribute.

The provisions in Section 4.3.4.2.1 also apply to EXT-X-I-FRAME-STREAM-INF tags with a VIDEO attribute.

A Master Playlist that specifies alternative VIDEO Renditions and I-frame Playlists SHOULD include an alternative I-frame VIDEO Rendition for each regular VIDEO Rendition, with the same NAME and LANGUAGE attributes.

4.3.4.4. EXT-X-SESSION-DATA

The EXT-X-SESSION-DATA tag allows arbitrary session data to be carried in a Master Playlist.

Its format is:

```
#EXT-X-SESSION-DATA:<attribute-list>
```

The following attributes are defined:

DATA-ID

The value of DATA-ID is a quoted-string that identifies a particular data value. The DATA-ID SHOULD conform to a reverse DNS naming convention, such as "com.example.movie.title"; however, there is no central registration authority, so Playlist authors SHOULD take care to choose a value that is unlikely to collide with others. This attribute is REQUIRED.

VALUE

VALUE is a quoted-string. It contains the data identified by DATA-ID. If the LANGUAGE is specified, VALUE SHOULD contain a human-readable string written in the specified language.

URI

The value is a quoted-string containing a URI. The resource identified by the URI MUST be formatted as JSON [RFC7159]; otherwise, clients may fail to interpret the resource.

LANGUAGE

The value is a quoted-string containing a language tag [RFC5646] that identifies the language of the VALUE. This attribute is OPTIONAL.

Each EXT-X-SESSION-DATA tag MUST contain either a VALUE or URI attribute, but not both.

A Playlist MAY contain multiple EXT-X-SESSION-DATA tags with the same DATA-ID attribute. A Playlist MUST NOT contain more than one EXT-X-SESSION-DATA tag with the same DATA-ID attribute and the same LANGUAGE attribute.

4.3.4.5. EXT-X-SESSION-KEY

The EXT-X-SESSION-KEY tag allows encryption keys from Media Playlists to be specified in a Master Playlist. This allows the client to preload these keys without having to read the Media Playlist(s) first.

Its format is:

```
#EXT-X-SESSION-KEY:<attribute-list>
```

All attributes defined for the EXT-X-KEY tag (Section 4.3.2.4) are also defined for the EXT-X-SESSION-KEY, except that the value of the METHOD attribute MUST NOT be NONE. If an EXT-X-SESSION-KEY is used, the values of the METHOD, KEYFORMAT, and KEYFORMATVERSIONS attributes MUST match any EXT-X-KEY with the same URI value.

EXT-X-SESSION-KEY tags SHOULD be added if multiple Variant Streams or Renditions use the same encryption keys and formats. An EXT-X-SESSION-KEY tag is not associated with any particular Media Playlist.

A Master Playlist MUST NOT contain more than one EXT-X-SESSION-KEY tag with the same METHOD, URI, IV, KEYFORMAT, and KEYFORMATVERSIONS attribute values.

The EXT-X-SESSION-KEY tag is optional.

4.3.5. Media or Master Playlist Tags

The tags in this section can appear in either Master Playlists or Media Playlists. If one of these tags appears in a Master Playlist, it SHOULD NOT appear in any Media Playlist referenced by that Master Playlist. A tag that appears in both MUST have the same value; otherwise, clients SHOULD ignore the value in the Media Playlist(s).

These tags MUST NOT appear more than once in a Playlist. If a tag appears more than once, clients MUST fail to parse the Playlist.

4.3.5.1. EXT-X-INDEPENDENT-SEGMENTS

The EXT-X-INDEPENDENT-SEGMENTS tag indicates that all media samples in a Media Segment can be decoded without information from other segments. It applies to every Media Segment in the Playlist.

Its format is:

```
#EXT-X-INDEPENDENT-SEGMENTS
```

If the EXT-X-INDEPENDENT-SEGMENTS tag appears in a Master Playlist, it applies to every Media Segment in every Media Playlist in the Master Playlist.

4.3.5.2. EXT-X-START

The EXT-X-START tag indicates a preferred point at which to start playing a Playlist. By default, clients SHOULD start playback at this point when beginning a playback session. This tag is OPTIONAL.

Its format is:

#EXT-X-START:<attribute-list>

The following attributes are defined:

TIME-OFFSET

The value of TIME-OFFSET is a signed-decimal-floating-point number of seconds. A positive number indicates a time offset from the beginning of the Playlist. A negative number indicates a negative time offset from the end of the last Media Segment in the Playlist. This attribute is REQUIRED.

The absolute value of TIME-OFFSET SHOULD NOT be larger than the Playlist duration. If the absolute value of TIME-OFFSET exceeds the duration of the Playlist, it indicates either the end of the Playlist (if positive) or the beginning of the Playlist (if negative).

If the Playlist does not contain the EXT-X-ENDLIST tag, the TIME-OFFSET SHOULD NOT be within three target durations of the end of the Playlist file.

PRECISE

The value is an enumerated-string; valid strings are YES and NO. If the value is YES, clients SHOULD start playback at the Media Segment containing the TIME-OFFSET, but SHOULD NOT render media samples in that segment whose presentation times are prior to the TIME-OFFSET. If the value is NO, clients SHOULD attempt to render every media sample in that segment. This attribute is OPTIONAL. If it is missing, its value should be treated as NO.

5. Key Files

5.1. Structure of Key Files

An EXT-X-KEY tag with a URI attribute identifies a Key file. A Key file contains a cipher key that can decrypt Media Segments in the Playlist.

[AES_128] encryption uses 16-octet keys. If the KEYFORMAT of an EXT-X-KEY tag is "identity", the Key file is a single packed array of 16 octets in binary format.

5.2. IV for AES-128

[AES_128] REQUIRES the same 16-octet IV to be supplied when encrypting and decrypting. Varying this IV increases the strength of the cipher.

An IV attribute on an EXT-X-KEY tag with a KEYFORMAT of "identity" specifies an IV that can be used when decrypting Media Segments encrypted with that Key file. IV values for AES-128 are 128-bit numbers.

An EXT-X-KEY tag with a KEYFORMAT of "identity" that does not have an IV attribute indicates that the Media Sequence Number is to be used as the IV when decrypting a Media Segment, by putting its big-endian binary representation into a 16-octet (128-bit) buffer and padding (on the left) with zeros.

6. Client/Server Responsibilities

6.1. Introduction

This section describes how the server generates the Playlist and Media Segments and how the client should download them for playback.

6.2. Server Responsibilities

6.2.1. General Server Responsibilities

The production of the source media is outside the scope of this document, which simply presumes a source of continuous encoded media containing the presentation.

The server MUST divide the source media into individual Media Segments whose duration is less than or equal to a constant target duration. Segments that are longer than the planned target duration can trigger playback stalls and other errors.

The server SHOULD attempt to divide the source media at points that support effective decode of individual Media Segments, e.g., on packet and key frame boundaries.

The server MUST create a URI for every Media Segment that enables its clients to obtain the segment data. If a server supports partial loading of resources (e.g., via HTTP Range requests), it MAY specify segments as sub-ranges of larger resources using the EXT-X-BYTERANGE tag.

Any Media Segment that is specified in a Playlist loaded by a client MUST be available for immediate download, or playback errors can occur. Once download starts, its transfer rate SHOULD NOT be constrained by the segment production process.

HTTP servers SHOULD transfer text files -- such as Playlists and WebVTT segments -- using the "gzip" Content-Encoding if the client indicates that it is prepared to accept it.

The server must create a Media Playlist file (Section 4) that contains a URI for each Media Segment that the server wishes to make available, in the order in which they are to be played.

The value of the EXT-X-VERSION tag (Section 4.3.1.2) SHOULD NOT be greater than what is required for the tags and attributes in the Playlist (see Section 7).

Changes to the Playlist file MUST be made atomically from the point of view of the clients, or playback errors MAY occur.

The server MUST NOT change the Media Playlist file, except to:

- o Append lines to it (Section 6.2.1).
- o Remove Media Segment URIs from the Playlist in the order that they appear, along with any tags that apply only to those segments (Section 6.2.2).
- o Increment the value of the EXT-X-MEDIA-SEQUENCE or EXT-X-DISCONTINUITY-SEQUENCE tags (Section 6.2.2).
- o Add an EXT-X-ENDLIST tag to the Playlist (Section 6.2.1).

A Media Playlist has further constraints on its updates if it contains an EXT-X-PLAYLIST-TYPE tag. An EXT-X-PLAYLIST-TYPE tag with a value of VOD indicates that the Playlist file MUST NOT change. An EXT-X-PLAYLIST-TYPE tag with a value of EVENT indicates that the server MUST NOT change or delete any part of the Playlist file; it MAY append lines to it.

The value of the EXT-X-TARGETDURATION tag in the Media Playlist MUST NOT change. A typical target duration is 10 seconds.

Playlist changes other than those allowed here can trigger playback errors and inconsistent client behavior.

Each Media Segment in a Media Playlist has an integer Discontinuity Sequence Number. The Discontinuity Sequence Number can be used in addition to the timestamps within the media to synchronize Media Segments across different Renditions.

A segment's Discontinuity Sequence Number is the value of the EXT-X-DISCONTINUITY-SEQUENCE tag (or zero if none) plus the number of EXT-X-DISCONTINUITY tags in the Playlist preceding the URI line of the segment.

The server MAY associate an absolute date and time with a Media Segment by applying an EXT-X-PROGRAM-DATE-TIME tag to it. This defines an informative mapping of the (wall-clock) date and time specified by the tag to the first media timestamp in the segment, which may be used as a basis for seeking, for display, or for other purposes. If a server provides this mapping, it SHOULD apply an EXT-X-PROGRAM-DATE-TIME tag to every segment that has an EXT-X-DISCONTINUITY tag applied to it.

The Server MUST NOT add any EXT-X-PROGRAM-DATE-TIME tag to a Playlist that would cause the mapping between program date and Media Segment to become ambiguous.

The server MUST NOT remove an EXT-X-DATERANGE tag from a Playlist if any date in the range maps to a Media Segment in the Playlist.

The server MUST NOT reuse the ID attribute value of an EXT-X-DATERANGE tag for any new Date Range in the same Playlist.

Once the Following Range of a Date Range with an END-ON-NEXT=YES attribute is added to a Playlist, the Server MUST NOT subsequently add a Date Range with the same CLASS attribute whose START-DATE is between that of the END-ON-NEXT=YES range and its Following Range.

For Date Ranges with a PLANNED-DURATION attribute, the Server SHOULD signal the actual end of the range once it has been established. It can do so by adding another EXT-X-DATERANGE tag with the same ID attribute value and either a DURATION or an END-DATE attribute or, if the Date Range has an END-ON-NEXT=YES attribute, by adding a Following Range.

If the Media Playlist contains the final Media Segment of the presentation, then the Playlist file MUST contain the EXT-X-ENDLIST tag; this allows clients to minimize unproductive Playlist reloads.

If a Media Playlist does not contain the EXT-X-ENDLIST tag, the server MUST make a new version of the Playlist file available that contains at least one new Media Segment. It MUST be made available relative to the time that the previous version of the Playlist file was made available: no earlier than one-half the target duration after that time, and no later than 1.5 times the target duration after that time. This allows clients to utilize the network efficiently.

If the server wishes to remove an entire presentation, it SHOULD provide a clear indication to clients that the Playlist file is no longer available (e.g., with an HTTP 404 or 410 response). It MUST ensure that all Media Segments in the Playlist file remain available to clients for at least the duration of the Playlist file at the time of removal to prevent interruption of in-progress playback.

6.2.2. Live Playlists

The server MAY limit the availability of Media Segments by removing Media Segments from the Playlist file (Section 6.2.1). If Media Segments are to be removed, the Playlist file MUST contain an EXT-X-MEDIA-SEQUENCE tag. Its value MUST be incremented by 1 for every Media Segment that is removed from the Playlist file; it MUST NOT decrease or wrap. Clients can malfunction if each Media Segment does not have a consistent, unique Media Sequence Number.

Media Segments MUST be removed from the Playlist file in the order that they appear in the Playlist; otherwise, client playback can malfunction.

The server MUST NOT remove a Media Segment from a Playlist file without an EXT-X-ENDLIST tag if that would produce a Playlist whose duration is less than three times the target duration. Doing so can trigger playback stalls.

When the server removes a Media Segment URI from the Playlist, the corresponding Media Segment MUST remain available to clients for a period of time equal to the duration of the segment plus the duration of the longest Playlist file distributed by the server containing that segment. Removing a Media Segment earlier than that can interrupt in-progress playback.

If the server wishes to remove segments from a Media Playlist containing an EXT-X-DISCONTINUITY tag, the Media Playlist MUST contain an EXT-X-DISCONTINUITY-SEQUENCE tag. Without the EXT-X-DISCONTINUITY-SEQUENCE tag, it can be impossible for a client to locate corresponding segments between Renditions.

If the server removes an EXT-X-DISCONTINUITY tag from the Media Playlist, it MUST increment the value of the EXT-X-DISCONTINUITY-SEQUENCE tag so that the Discontinuity Sequence Numbers of the segments still in the Media Playlist remain unchanged. The value of the EXT-X-DISCONTINUITY-SEQUENCE tag MUST NOT decrease or wrap. Clients can malfunction if each Media Segment does not have a consistent Discontinuity Sequence Number.

If a server plans to remove a Media Segment after it is delivered to clients over HTTP, it SHOULD ensure that the HTTP response contains an Expires header that reflects the planned time-to-live.

A Live Playlist MUST NOT contain the EXT-X-PLAYLIST-TYPE tag, as no value of that tag allows Media Segments to be removed.

6.2.3. Encrypting Media Segments

Media Segments MAY be encrypted. Every encrypted Media Segment MUST have an EXT-X-KEY tag (Section 4.3.2.4) applied to it with a URI that the client can use to obtain a Key file (Section 5) containing the decryption key.

A Media Segment can only be encrypted with one encryption METHOD, using one encryption key and IV. However, a server MAY offer multiple ways to retrieve that key by providing multiple EXT-X-KEY tags, each with a different KEYFORMAT attribute value.

The server MAY set the HTTP Expires header in the key response to indicate the duration for which the key can be cached.

Any unencrypted Media Segment in a Playlist that is preceded by an encrypted Media Segment MUST have an EXT-X-KEY tag applied to it with a METHOD attribute of NONE. Otherwise, the client will misinterpret those segments as encrypted.

If the encryption METHOD is AES-128 and the Playlist does not contain the EXT-X-I-FRAMES-ONLY tag, AES encryption as described in Section 4.3.2.4 SHALL be applied to individual Media Segments.

If the encryption METHOD is AES-128 and the Playlist contains an EXT-X-I-FRAMES-ONLY tag, the entire resource MUST be encrypted using AES-128 CBC with PKCS7 padding [RFC5652]. Encryption MAY be restarted on 16-byte block boundaries, unless the first block contains an I-frame. The IV used for encryption MUST be either the Media Sequence Number of the Media Segment or the value of the IV attribute of the EXT-X-KEY tag, as described in Section 5.2. These constraints allow a client to load and decrypt individual I-frames specified as sub-ranges of regular encrypted Media Segments, and their Media Initialization Sections.

If the encryption METHOD is SAMPLE-AES, media samples MAY be encrypted prior to encapsulation in a Media Segment.

The server MUST NOT remove an EXT-X-KEY tag from the Playlist file if it applies to any Media Segment in the Playlist file, or clients who subsequently load that Playlist will be unable to decrypt those Media Segments.

6.2.4. Providing Variant Streams

A server MAY offer multiple Media Playlist files to provide different encodings of the same presentation. If it does so, it SHOULD provide a Master Playlist file that lists each Variant Stream to allow clients to switch between encodings dynamically.

Master Playlists describe regular Variant Streams with EXT-X-STREAM-INF tags and I-frame Variant Streams with EXT-X-I-FRAME-STREAM-INF tags.

If an EXT-X-STREAM-INF tag or EXT-X-I-FRAME-STREAM-INF tag contains the CODECS attribute, the attribute value MUST include every media format [RFC6381] present in any Media Segment in any of the Renditions specified by the Variant Stream.

The server MUST meet the following constraints when producing Variant Streams in order to allow clients to switch between them seamlessly:

- o Each Variant Stream MUST present the same content.
- o Matching content in Variant Streams MUST have matching timestamps. This allows clients to synchronize the media.
- o Matching content in Variant Streams MUST have matching Discontinuity Sequence Numbers (see Section 4.3.3.3).
- o Each Media Playlist in each Variant Stream MUST have the same target duration. The only exceptions are SUBTITLES Renditions and Media Playlists containing an EXT-X-I-FRAMES-ONLY tag, which MAY have different target durations if they have an EXT-X-PLAYLIST-TYPE of VOD.
- o Content that appears in a Media Playlist of one Variant Stream but not in another MUST appear either at the beginning or at the end of the Media Playlist file and MUST NOT be longer than the target duration.
- o If any Media Playlists have an EXT-X-PLAYLIST-TYPE tag, all Media Playlists MUST have an EXT-X-PLAYLIST-TYPE tag with the same value.
- o If the Playlist contains an EXT-X-PLAYLIST-TYPE tag with the value of VOD, the first segment of every Media Playlist in every Variant Stream MUST start at the same media timestamp.
- o If any Media Playlist in a Master Playlist contains an EXT-X-PROGRAM-DATE-TIME tag, then all Media Playlists in that Master Playlist MUST contain EXT-X-PROGRAM-DATE-TIME tags with consistent mappings of date and time to media timestamps.
- o Each Variant Stream MUST contain the same set of Date Ranges, each one identified by an EXT-X-DATERANGE tag(s) with the same ID attribute value and containing the same set of attribute/value pairs.

In addition, for broadest compatibility, Variant Streams SHOULD contain the same encoded audio bitstream. This allows clients to switch between Variant Streams without audible glitching.

The rules for Variant Streams also apply to alternative Renditions (see Section 4.3.4.2.1).

6.3. Client Responsibilities

6.3.1. General Client Responsibilities

How the client obtains the URI to the Playlist file is outside the scope of this document; it is presumed to have done so.

The client obtains the Playlist file from the URI. If the Playlist file so obtained is a Master Playlist, the client can select a Variant Stream to load from the Master Playlist.

Clients MUST ensure that loaded Playlists comply with Section 4 and that the EXT-X-VERSION tag, if present, specifies a protocol version supported by the client; if either check fails, the client MUST NOT attempt to use the Playlist, or unintended behavior could occur.

If any URI element in a Playlist contains an URI scheme that the client cannot handle, the client MUST stop playback. All clients MUST support HTTP schemes.

To support forward compatibility, when parsing Playlists, clients MUST:

- o ignore any unrecognized tags.
- o ignore any attribute/value pair with an unrecognized AttributeName.
- o ignore any tag containing an attribute/value pair of type enumerated-string whose AttributeName is recognized but whose AttributeValue is not recognized, unless the definition of the attribute says otherwise.

Algorithms used by the client to switch between Variant Streams are beyond the scope of this document.

6.3.2. Loading the Media Playlist File

Every time a Media Playlist is loaded or reloaded from a Playlist URI, the client MUST determine the next Media Segment to load, as described in Section 6.3.5, if it intends to play the presentation normally (i.e., in Playlist order at the nominal playback rate).

If the Media Playlist contains the EXT-X-MEDIA-SEQUENCE tag, the client SHOULD assume that each Media Segment in it will become unavailable at the time that the Playlist file was loaded plus the duration of the Playlist file.

A client MAY use the segment Media Sequence Number to track the location of a Media Segment within a Playlist when the Playlist is reloaded.

A client MUST NOT assume that segments with the same Media Sequence Number in different Variant Streams or Renditions have the same position in the presentation; Playlists MAY have independent Media Sequence Numbers. Instead, a client MUST use the relative position of each segment on the Playlist timeline and its Discontinuity Sequence Number to locate corresponding segments.

A client MUST load the Media Playlist file of every Rendition selected for playback in order to locate the media specific to that Rendition. But, to prevent unnecessary load on the server, it SHOULD NOT load the Playlist file of any other Rendition.

For some Variant Streams, it is possible to select Renditions that do not include the Rendition specified by the EXT-X-STREAM-INF tag. As noted above, the client SHOULD NOT load that Rendition in those cases.

6.3.3. Playing the Media Playlist File

The client SHALL choose which Media Segment to play first from the Media Playlist when playback starts. If the EXT-X-ENDLIST tag is not present and the client intends to play the media normally, the client SHOULD NOT choose a segment that starts less than three target durations from the end of the Playlist file. Doing so can trigger playback stalls.

Normal playback can be achieved by playing the Media Segments in the order that they appear in the Playlist. The client MAY present the available media in any way it wishes, including normal playback, random access, and trick modes.

The encoding parameters for samples in a Media Segment and across multiple Media Segments in a Media Playlist SHOULD remain consistent. However, clients SHOULD deal with encoding changes as they are encountered, for example, by scaling video content to accommodate a resolution change. If the Variant Stream includes a RESOLUTION attribute, clients SHOULD display all video within a rectangle with the same proportions as that resolution.

Clients SHOULD be prepared to handle multiple tracks of a particular type (e.g., audio or video). A client with no other preference SHOULD choose the track with the lowest numerical track identifier that it can play.

Clients SHOULD ignore private streams inside Transport Streams that they do not recognize. Private streams can be used to support different devices with the same stream, although stream authors SHOULD be sensitive to the additional network load that this imposes.

The client MUST be prepared to reset its parser(s) and decoder(s) before playing a Media Segment that has an EXT-X-DISCONTINUITY tag applied to it; otherwise, playback errors can occur.

The client SHOULD attempt to load Media Segments in advance of when they will be required for uninterrupted playback to compensate for temporary variations in latency and throughput.

The client MAY use the value of the EXT-X-PROGRAM-DATE-TIME tag to display the program origination time to the user. If the value includes time zone information, the client SHALL take it into account; if it does not, the client MAY assume the time to be local.

Note that dates in Playlists can refer to when the content was produced (or to other times), which have no relation to the time of playback.

If the first EXT-X-PROGRAM-DATE-TIME tag in a Playlist appears after one or more Media Segment URIs, the client SHOULD extrapolate backward from that tag (using EXTINF durations and/or media timestamps) to associate dates with those segments. To associate a date with any other Media Segment that does not have an EXT-X-PROGRAM-DATE-TIME tag applied to it directly, the client SHOULD extrapolate forward from the last EXT-X-PROGRAM-DATE-TIME tag appearing before that segment in the Playlist.

6.3.4. Reloading the Media Playlist File

The client MUST periodically reload a Media Playlist file to learn what media is currently available, unless it contains an EXT-X-PLAYLIST-TYPE tag with a value of VOD, or a value of EVENT and the EXT-X-ENDLIST tag is also present.

However, the client MUST NOT attempt to reload the Playlist file more frequently than specified by this section, in order to limit the collective load on the server.

When a client loads a Playlist file for the first time or reloads a Playlist file and finds that it has changed since the last time it was loaded, the client MUST wait for at least the target duration before attempting to reload the Playlist file again, measured from the last time the client began loading the Playlist file.

If the client reloads a Playlist file and finds that it has not changed, then it **MUST** wait for a period of one-half the target duration before retrying.

After reloading a Media Playlist, the client **SHOULD** verify that each Media Segment in it has the same URI (and byte range, if specified) as the Media Segment with the same Media Sequence Number in the previous Media Playlist. It **SHOULD** halt playback if it does not, as this normally indicates a server error.

In order to reduce server load, the client **SHOULD NOT** reload the Playlist files of Variant Streams or alternate Renditions that are not currently being played. If it decides to switch playback to a different Variant Stream, it **SHOULD** stop reloading the Playlist of the old Variant Stream and begin loading the Playlist of the new Variant Stream. It can use the EXTINF durations and the constraints in Section 6.2.4 to determine the approximate location of corresponding media. Once media from the new Variant Stream has been loaded, the timestamps in the Media Segments can be used to synchronize the old and new timelines precisely.

A client **MUST NOT** attempt to use the Media Sequence Number to synchronize between streams (see Section 6.3.2).

6.3.5. Determining the Next Segment to Load

The client **MUST** examine the Media Playlist file every time it is loaded or reloaded to determine the next Media Segment to load, as the set of available media **MAY** have changed.

The first segment to load is generally the segment that the client has chosen to play first (see Section 6.3.3).

In order to play the presentation normally, the next Media Segment to load is the one with the lowest Media Sequence Number that is greater than the Media Sequence Number of the last Media Segment loaded.

6.3.6. Decrypting Encrypted Media Segments

If a Media Playlist file contains an EXT-X-KEY tag that specifies a Key file URI, the client can obtain that Key file and use the key inside it to decrypt all Media Segments to which that EXT-X-KEY tag applies.

A client MUST ignore any EXT-X-KEY tag with an unsupported or unrecognized KEYFORMAT attribute, to allow for cross-device addressability. If the Playlist contains a Media Segment to which only EXT-X-KEY tags with unrecognized or unsupported KEYFORMAT attributes are applied, playback SHOULD fail.

A client MUST NOT attempt to decrypt any segments whose EXT-X-KEY tag has a METHOD attribute that it does not recognize.

If the encryption METHOD is AES-128, AES-128 CBC decryption SHALL be applied to individual Media Segments, whose encryption format is described in Section 4.3.2.4.

If the encryption METHOD is AES-128 and the Media Segment is part of an I-frame Playlist (Section 4.3.3.6) and it has an EXT-X-BYTERANGE tag applied to it, special care needs to be taken in loading and decrypting the segment, because the resource identified by the URI is encrypted in 16-byte blocks from the start of the resource.

The decrypted I-frame can be recovered by first widening its byte range, as specified by the EXT-X-BYTERANGE tag, so that it starts and ends on 16-byte boundaries from the start of the resource.

Next, the byte range is widened further to include a 16-byte block at the beginning of the range. This 16-byte block allows the correct IV for the following block to be calculated.

The widened byte range can then be loaded and decrypted with AES-128 CBC using an arbitrary IV. The number of bytes added to the beginning and the end of the original byte range are discarded from the decrypted bytes; what remains is the decrypted I-frame.

If the encryption METHOD is SAMPLE-AES, AES-128 decryption SHALL be applied to encrypted media samples within the Media Segment.

An EXT-X-KEY tag with a METHOD of NONE indicates that the Media Segments it applies to are not encrypted.

7. Protocol Version Compatibility

Protocol compatibility is specified by the EXT-X-VERSION tag. A Playlist that contains tags or attributes that are not compatible with protocol version 1 MUST include an EXT-X-VERSION tag.

A client MUST NOT attempt playback if it does not support the protocol version specified by the EXT-X-VERSION tag, or unintended behavior could occur.

A Media Playlist MUST indicate an EXT-X-VERSION of 2 or higher if it contains:

- o The IV attribute of the EXT-X-KEY tag.

A Media Playlist MUST indicate an EXT-X-VERSION of 3 or higher if it contains:

- o Floating-point EXTINF duration values.

A Media Playlist MUST indicate an EXT-X-VERSION of 4 or higher if it contains:

- o The EXT-X-BYTERANGE tag.
- o The EXT-X-I-FRAMES-ONLY tag.

A Media Playlist MUST indicate an EXT-X-VERSION of 5 or higher if it contains:

- o The KEYFORMAT and KEYFORMATVERSIONS attributes of the EXT-X-KEY tag.
- o The EXT-X-MAP tag.

A Media Playlist MUST indicate an EXT-X-VERSION of 6 or higher if it contains:

- o The EXT-X-MAP tag in a Media Playlist that does not contain EXT-X-I-FRAMES-ONLY.

A Master Playlist MUST indicate an EXT-X-VERSION of 7 or higher if it contains:

- o "SERVICE" values for the INSTREAM-ID attribute of the EXT-X-MEDIA tag.

The EXT-X-MEDIA tag and the AUDIO, VIDEO, and SUBTITLES attributes of the EXT-X-STREAM-INF tag are backward compatible to protocol version 1, but playback on older clients may not be desirable. A server MAY consider indicating an EXT-X-VERSION of 4 or higher in the Master Playlist but is not required to do so.

The PROGRAM-ID attribute of the EXT-X-STREAM-INF and the EXT-X-I-FRAME-STREAM-INF tags was removed in protocol version 6.

The EXT-X-ALLOW-CACHE tag was removed in protocol version 7.

8. Playlist Examples

8.1. Simple Media Playlist

```
#EXTM3U
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:3
#EXTINF:9.009,
http://media.example.com/first.ts
#EXTINF:9.009,
http://media.example.com/second.ts
#EXTINF:3.003,
http://media.example.com/third.ts
#EXT-X-ENDLIST
```

8.2. Live Media Playlist Using HTTPS

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-TARGETDURATION:8
#EXT-X-MEDIA-SEQUENCE:2680

#EXTINF:7.975,
https://priv.example.com/fileSequence2680.ts
#EXTINF:7.941,
https://priv.example.com/fileSequence2681.ts
#EXTINF:7.975,
https://priv.example.com/fileSequence2682.ts
```

8.3. Playlist with Encrypted Media Segments

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-MEDIA-SEQUENCE:7794
#EXT-X-TARGETDURATION:15

#EXT-X-KEY:METHOD=AES-128,URI="https://priv.example.com/key.php?r=52"

#EXTINF:2.833,
http://media.example.com/fileSequence52-A.ts
#EXTINF:15.0,
http://media.example.com/fileSequence52-B.ts
#EXTINF:13.333,
http://media.example.com/fileSequence52-C.ts

#EXT-X-KEY:METHOD=AES-128,URI="https://priv.example.com/key.php?r=53"

#EXTINF:15.0,
http://media.example.com/fileSequence53-A.ts
```

8.4. Master Playlist

```
#EXTM3U
#EXT-X-STREAM-INF:BANDWIDTH=1280000,AVERAGE-BANDWIDTH=1000000
http://example.com/low.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2560000,AVERAGE-BANDWIDTH=2000000
http://example.com/mid.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=7680000,AVERAGE-BANDWIDTH=6000000
http://example.com/hi.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=65000,CODECS="mp4a.40.5"
http://example.com/audio-only.m3u8
```

8.5. Master Playlist with I-Frames

```
#EXTM3U
#EXT-X-STREAM-INF:BANDWIDTH=1280000
low/audio-video.m3u8
#EXT-X-I-FRAME-STREAM-INF:BANDWIDTH=86000,URI="low/iframe.m3u8"
#EXT-X-STREAM-INF:BANDWIDTH=2560000
mid/audio-video.m3u8
#EXT-X-I-FRAME-STREAM-INF:BANDWIDTH=150000,URI="mid/iframe.m3u8"
#EXT-X-STREAM-INF:BANDWIDTH=7680000
hi/audio-video.m3u8
#EXT-X-I-FRAME-STREAM-INF:BANDWIDTH=550000,URI="hi/iframe.m3u8"
#EXT-X-STREAM-INF:BANDWIDTH=65000,CODECS="mp4a.40.5"
audio-only.m3u8
```

8.6. Master Playlist with Alternative Audio

In this example, the CODECS attributes have been condensed for space. A '\' is used to indicate that the tag continues on the following line with whitespace removed:

```
#EXTM3U
#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="aac",NAME="English", \
  DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en", \
  URI="main/english-audio.m3u8"
#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="aac",NAME="Deutsch", \
  DEFAULT=NO,AUTOSELECT=YES,LANGUAGE="de", \
  URI="main/german-audio.m3u8"
#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="aac",NAME="Commentary", \
  DEFAULT=NO,AUTOSELECT=NO,LANGUAGE="en", \
  URI="commentary/audio-only.m3u8"
#EXT-X-STREAM-INF:BANDWIDTH=1280000,CODECS="...",AUDIO="aac"
low/video-only.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2560000,CODECS="...",AUDIO="aac"
mid/video-only.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=7680000,CODECS="...",AUDIO="aac"
hi/video-only.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=650000,CODECS="mp4a.40.5",AUDIO="aac"
main/english-audio.m3u8
```

8.7. Master Playlist with Alternative Video

This example shows three different video Renditions (Main, Centerfield, and Dugout) and three different Variant Streams (low, mid, and high). In this example, clients that did not support the EXT-X-MEDIA tag and the VIDEO attribute of the EXT-X-STREAM-INF tag would only be able to play the video Rendition "Main".

Since the EXT-X-STREAM-INF tag has no AUDIO attribute, all video Renditions would be required to contain the audio.

In this example, the CODECS attributes have been condensed for space. A '\' is used to indicate that the tag continues on the following line with whitespace removed:

```
#EXTM3U
#EXT-X-MEDIA:TYPE=VIDEO,GROUP-ID="low",NAME="Main", \
  DEFAULT=YES,URI="low/main/audio-video.m3u8"
#EXT-X-MEDIA:TYPE=VIDEO,GROUP-ID="low",NAME="Centerfield", \
  DEFAULT=NO,URI="low/centerfield/audio-video.m3u8"
#EXT-X-MEDIA:TYPE=VIDEO,GROUP-ID="low",NAME="Dugout", \
  DEFAULT=NO,URI="low/dugout/audio-video.m3u8"

#EXT-X-STREAM-INF:BANDWIDTH=1280000,CODECS="...",VIDEO="low"
low/main/audio-video.m3u8

#EXT-X-MEDIA:TYPE=VIDEO,GROUP-ID="mid",NAME="Main", \
  DEFAULT=YES,URI="mid/main/audio-video.m3u8"
#EXT-X-MEDIA:TYPE=VIDEO,GROUP-ID="mid",NAME="Centerfield", \
  DEFAULT=NO,URI="mid/centerfield/audio-video.m3u8"
#EXT-X-MEDIA:TYPE=VIDEO,GROUP-ID="mid",NAME="Dugout", \
  DEFAULT=NO,URI="mid/dugout/audio-video.m3u8"

#EXT-X-STREAM-INF:BANDWIDTH=2560000,CODECS="...",VIDEO="mid"
mid/main/audio-video.m3u8

#EXT-X-MEDIA:TYPE=VIDEO,GROUP-ID="hi",NAME="Main", \
  DEFAULT=YES,URI="hi/main/audio-video.m3u8"
#EXT-X-MEDIA:TYPE=VIDEO,GROUP-ID="hi",NAME="Centerfield", \
  DEFAULT=NO,URI="hi/centerfield/audio-video.m3u8"
#EXT-X-MEDIA:TYPE=VIDEO,GROUP-ID="hi",NAME="Dugout", \
  DEFAULT=NO,URI="hi/dugout/audio-video.m3u8"

#EXT-X-STREAM-INF:BANDWIDTH=7680000,CODECS="...",VIDEO="hi"
hi/main/audio-video.m3u8
```

8.8. Session Data in a Master Playlist

In this example, only the EXT-X-SESSION-DATA is shown:

```
#EXT-X-SESSION-DATA:DATA-ID="com.example.lyrics",URI="lyrics.json"

#EXT-X-SESSION-DATA:DATA-ID="com.example.title",LANGUAGE="en", \
  VALUE="This is an example"
#EXT-X-SESSION-DATA:DATA-ID="com.example.title",LANGUAGE="es", \
  VALUE="Este es un ejemplo"
```

8.9. CHARACTERISTICS Attribute Containing Multiple Characteristics

Certain characteristics are valid in combination, as in:

```
CHARACTERISTICS=
"public.accessibility.transcribes-spoken-dialog,public.easy-to-read"
```

8.10. EXT-X-DATERANGE Carrying SCTE-35 Tags

This example shows two EXT-X-DATERANGE tags that describe a single Date Range, with an SCTE-35 "out" splice_insert() command that is subsequently updated with an SCTE-35 "in" splice_insert() command.

```
#EXTM3U
...
#EXT-X-DATERANGE:ID="splice-6FFFFFFF0",START-DATE="2014-03-05T11:
15:00Z",PLANNED-DURATION=59.993,SCTE35-OUT=0xFC002F0000000000FF0
00014056FFFFFFF000E011622DCAFF00005263620000000000A0008029896F50
0000087000000000
... Media Segment declarations for 60s worth of media

#EXT-X-DATERANGE:ID="splice-6FFFFFFF0",DURATION=59.993,SCTE35-IN=
0xFC002A0000000000FF00000F056FFFFFFF000401162802E6100000000000A00
08029896F50000008700000000
...
```

9. IANA Considerations

IANA has registered the following media type [RFC2046]:

Type name: application

Subtype name: vnd.apple.mpegurl

Required parameters: none

Optional parameters: none

Encoding considerations: encoded as UTF-8, which is 8-bit text. This media type may require encoding on transports not capable of handling 8-bit text. See Section 4 for more information.

Security considerations: See Section 10.

Compression: this media type does not employ compression.

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Interoperability considerations: There are no byte-ordering issues, since files are 8-bit text. Applications could encounter unrecognized tags, which SHOULD be ignored.

Published specification: see Section 4.

Applications that use this media type: Multimedia applications such as the iPhone media player in iOS 3.0 and later and QuickTime Player in Mac OS X version 10.6 and later.

Fragment identifier considerations: no Fragment Identifiers are defined for this media type.

Additional information:

Deprecated alias names for this type: none
 Magic number(s): #EXTM3U
 File extension(s): .m3u8, .m3u (see Section 4)
 Macintosh file type code(s): none

Person & email address to contact for further information: David Singer, singer@apple.com.

Intended usage: LIMITED USE

Restrictions on usage: none

Author: Roger Pantos

Change Controller: David Singer

10. Security Considerations

Since the protocol generally uses HTTP to transfer data, most of the same security considerations apply. See Section 15 of HTTP [RFC7230].

Media file parsers are typically subject to "fuzzing" attacks. Implementors SHOULD pay particular attention to code that will parse data received from a server and ensure that all possible inputs are handled correctly.

Playlist files contain URIs, which clients will use to make network requests of arbitrary entities. Clients SHOULD range-check responses to prevent buffer overflows. See also the Security Considerations section of "Uniform Resource Identifier (URI): Generic Syntax" [RFC3986].

Apart from URL resolution, this format does not employ any form of active content.

Clients SHOULD limit each playback session to a reasonable number of concurrent downloads (e.g., four) to avoid contributing to denial-of-service attacks.

HTTP requests often include session state ("cookies"), which may contain private user data. Implementations MUST follow cookie restriction and expiry rules specified by "HTTP State Management Mechanism" [RFC6265] to protect themselves from attack. See also the Security Considerations section of that document, and "Use of HTTP State Management" [RFC2964].

Encryption keys are specified by URI. The delivery of these keys SHOULD be secured by a mechanism such as HTTP Over TLS [RFC2818] (formerly SSL) in conjunction with a secure realm or a session token.

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[general/conceptual/DevPedia-CocoaCore/](http://developer.apple.com/library/ios/#documentation/general/conceptual/DevPedia-CocoaCore/UniformTypeIdentifier.html)
[UniformTypeIdentifier.html](http://developer.apple.com/library/ios/#documentation/general/conceptual/DevPedia-CocoaCore/UniformTypeIdentifier.html)>.

Contributors

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EXHIBIT T

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN FITNESS DEVICES, STREAMING
COMPONENTS THEREOF, AND SYSTEMS
CONTAINING SAME**

INV. NO. 337-TA-1265

**INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND
RECOMMENDED DETERMINATION ON REMEDY AND BOND**

Chief Administrative Law Judge Clark S. Cheney

(September 9, 2022)

Pursuant to the notice of investigation, 86 Fed. Reg. 27106 (May 19, 2021), this is the initial determination in *Certain Fitness Devices, Streaming Components Thereof, and Systems Containing Same*, United States International Trade Commission Investigation No. 337-TA-1265.

A violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain fitness devices, streaming components thereof, and systems containing same, with respect to U.S. Patent No. 9,407,564; U.S. Patent No. 10,469,554; U.S. Patent No. 10,469,555; and U.S. Patent No. 10,757,156.

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Table of Abbreviations

ALJ	-	Administrative Law Judge
CDX	-	Complainants' Demonstrative Exhibit
CPX	-	Complainants' Physical Exhibit
CX	-	Complainants' Exhibit
Compl.	-	Complaint
Compls. Br.	-	Complainants' Post-Hearing Brief
Dep.	-	Deposition
DWS	-	Direct Witness Statement
EDIS	-	Electronic Document Imaging System
JPX	-	Joint Physical Exhibit
JX	-	Joint Exhibit
P.H.	-	Prehearing
PTO	-	U.S. Patent and Trademark Office
RDX	-	Respondents' Demonstrative Exhibit
RPX	-	Respondents' Physical Exhibit
RWS	-	Rebuttal Witness Statement
RX	-	Respondents' Exhibit
Resps. Br.	-	Respondents Post-Hearing Brief
Staff Br.	-	Commission Investigative Attorney's Post-Hearing Brief
Tr.	-	Transcript

I. INTRODUCTION

A. Procedural History

By publication of a notice in the *Federal Register* on May 19, 2021, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, the Commission instituted this investigation to determine:

[W]hether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain products identified in paragraph (2) by reason of infringement of one or more of claims 1, 3-8, 10, and 13-15 of the '564 patent [U.S. Patent No. 9,407,564]; claims 16-25 and 30 of the '554 patent [U.S. Patent No. 10,469,554]; claims 10-17 and 26-27 of the '555 patent [U.S. Patent No. 10,469,555]; claims 1-12 of the '156 patent [U.S. Patent No. 10,757,156]; and claims 14-16, 18-21, and 28-29 of the '680 patent [U.S. Patent No. 10,951,680]; and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

86 Fed. Reg. 27106 (May 19, 2021).

The Commission named as complainants DISH DBS Corporation (“DDBS”) of Englewood, Colorado; DISH Technologies L.L.C. (“DTL”) of Englewood, Colorado; and Sling TV L.L.C. (“STL”) of Englewood, Colorado. *Id.* DDBS, DTL, and STL are referred to collectively herein as “DISH” or “complainants.”

The Commission named as respondents ICON Health & Fitness, Inc. (“ICON”) of Logan, Utah; FreeMotion Fitness, Inc. (“FreeMotion”) of Logan, Utah; NordicTrack, Inc. (“NordicTrack”) of Logan, Utah; lululemon athletica inc. (“lululemon”) of Vancouver, Canada; Curiouser Products Inc. d/b/a MIRROR (“Curiouser”) of New York, New York; and Peloton Interactive, Inc. (“Peloton”) of New York, New York (collectively, “respondents”). *Id.*

The Office of Unfair Import Investigations (“Staff”) was also named as a party to this investigation. *Id.*

[REDACTED]

The target date for completion of this investigation was set at November 19, 2022, which is 18 months from institution. Order No. 4 (Initial Determination) (June 9, 2021), unreviewed, *see* Notice of Commission Decision Not to Review an Initial Determination Setting an 18-Month Target Date (EDIS Doc. ID No. 745716) (June 29, 2021). An evidentiary hearing was originally scheduled for March 21-25, 2022. Order No. 6 (June 28, 2021).

On September 8, 2021, the investigation was reassigned to Administrative Law Judge David P. Shaw. *See* Notice to the Parties (Sept. 8, 2021) (EDIS Doc. ID No. 751195).

On September 22, 2021, in view of the reassignment of the investigation, the parties jointly moved to amend the procedural schedule, and to reschedule the evidentiary hearing to take place from March 9-15, 2022. The administrative law judge granted the motion. Order No. 13 (Sept. 24, 2021).

On September 24, 2021, ICON moved to amend the notice of investigation such “that the name ‘ICON Health & Fitness, Inc.’ be replaced with ‘iFIT Inc.’” The administrative law judge granted the motion in an initial determination. Order No. 14 (Nov. 4, 2021), unreviewed, Notice of a Commission Determination Not to Review an Initial Determination Granting Respondent Icon’s Motion to Amend the Notice of Investigation (EDIS Doc. ID No. 758005) (Dec. 6, 2021).

On October 14, 2021, DISH filed a motion to terminate the investigation in part and to withdraw allegations in its complaint that any respondents infringe claims 6, 11, and 12 of the ’156 patent; claim 22 of the ’554 patent, and claim 17 of the ’555 patent. In addition, DISH withdrew allegations that iFIT Inc.; Free Motion; NordicTrack; and Peloton infringe claims 9 and 12 of the ’156 patent, claim 19 of the ’554 patent, claims 12 and 13 of the ’555 patent, and claim 6 of the ’564 patent. The administrative law judge granted the motion in an initial determination. Order No. 15 (Nov. 19, 2021), unreviewed, Commission Determination Not to Review an Initial

Determination Granting Complainants' Motion for Partial Termination of Investigation (Dec. 20, 2021) (EDIS Doc. No. 758930).

On February 18, 2022, DISH filed a motion to terminate the investigation in part and to withdraw allegations in its complaint that any respondents infringe claims 6-8, 10, and 13-15 of the '564 patent, claims 18-19, 21, 23-25, and 30 of the '554 patent, claims 12-13, 16, and 26-27 of the '555 patent, claims 3, and 7-10 of the '156 patent, and all asserted claims of the '680 patent. The administrative law judge granted the motion in an initial determination. Order No. 21 (Mar. 3, 2022), unreviewed, Commission Determination Not to Review an Initial Determination Granting Complainants' Motion for Partial Termination of the Investigation (Mar. 23, 2022) (EDIS Doc. No. 766127).

A prehearing conference was held on March 9, 2022, with the evidentiary hearing in this investigation commencing immediately thereafter. DISH, iFIT Inc., FreeMotion, NordicTrack, lululemon, Curiouser, and Peloton participated in the hearing. The hearing concluded on March 14, 2022. *See* Order No. 20 (Mar. 1, 2022); P.H. Tr. 1-26; Tr. 1-656. The parties were requested to file post-hearing briefs not to exceed 300 pages in length, and to file reply briefs not to exceed 90 pages in length. Order No. 20 at 4.

On March 29, 2022, DISH filed its post-hearing brief, which asserts, against all respondents, claims 1 and 3-5 of the '564 patent (Compls. Br. at 47), claims 16, 17, and 20 of the '554 patent (*id.* at 82), claims 10, 11, 14 and 15 of the '555 patent (*id.* at 93), and claims 1, 4 and 5 of the '156 patent (*id.* at 103). DISH also asserts claim 2 of the '156 patent against Peloton. *See id.* at 111.

Pursuant to Order No. 2 (Ground Rules), the parties also submitted a joint outline of the issues to be decided in the Final Initial Determination. *See* Joint Outline of Issues to Be Decided in the Final Initial Determination (EDIS Doc. ID No. 768188) (“Joint Outline”).

On June 23, 2022, the investigation was reassigned to Chief Administrative Law Judge Clark S. Cheney. *See* Notice to the Parties (June 23, 2022) (EDIS Doc. ID No. 773712).

On July 19, 2022, July 28, 2022, and August 12, 2022, I issued three initial determinations extending the target date, and setting a due date of September 9, 2022 for this final initial determination. *See* Order No. 23 (July 19, 2022) (EDIS Doc. ID No. 775744); Order No. 24 (July 28, 2022) (EDIS Doc. ID No. 776430); Order No. 25 (Aug. 12, 2022) (EDIS Doc. ID No. 777802).

B. The Private Parties

1. Complainant DISH

Complainant DDBS is a Colorado corporation with a principal place of business at 9601 South Meridian Boulevard, Englewood, Colorado 80112. Compl., ¶ 3.1 (EDIS Doc ID 739751). DDBS is a wholly owned indirect subsidiary of DISH Network Corporation. *Id.*, ¶ 3.2. Complainants DTL and STL are Colorado limited liability companies with their principal place of business at 9601 South Meridian Boulevard, Englewood, Colorado 80112. *Id.*, ¶¶ 3.12, 3.17. DTL and STL are indirect wholly owned subsidiaries of DDBS. *Id.*, ¶¶ 3.13, 3.18.

2. Respondent Peloton

Respondent Peloton is a Delaware corporation with its principal place of business at 125 West 25th Street, 11th Floor, New York, New York 10001. Peloton Resp. to Compl. (EDIS Doc ID 745054), ¶ 3.45.

3. Respondent iFit

Respondent iFit Inc. is a Delaware corporation with its principal place of business at 1500 South 1000 West, Logan, Utah 84321. ICON Health & Fitness Resp. to Compl. (EDIS Doc ID 745068), ¶ 3.25. Respondents FreeMotion and NordicTrack are Utah corporations with their principal place of business located at the same address. *Id.*, ¶¶ 3.29, 3.33. Respondents iFit Inc., FreeMotion and NordicTrack are referred to collectively herein as “iFit.”

4. Respondent MIRROR

Respondent lululemon is a Delaware corporation with its principal place of business at 1818 Cornwall Ave., Vancouver, British Columbia, Canada V6J 1C7. MIRROR Resp. to Compl. (EDIS Doc ID 745062), ¶ 3.38. Respondent Curiouser is a Delaware corporation with its principal place of business at 1261 Broadway, # 208, New York, New York 10001. *Id.*, ¶ 3.40. Respondents lululemon and Curiouser are referred to collectively herein as “MIRROR.”

C. Overview of the Technology

The technology at issue generally relates to streaming video and audio content over the Internet. The parties stipulated to the following general description of the relevant technology:

The technology at issue in this Investigation is the delivery of video over networks such as the Internet using adaptive bitrate streaming. Streaming refers to technology that delivers audio/video content from a server to a client at a bitrate that allows the user to view the content contemporaneous with its receipt. The higher the bitrate of the video, the more data (in bits) it takes to represent and stream that video. The delivery of the content may be limited by the speed of the end-user’s network connection. The network speed can change during the course of content delivery resulting in buffering and stalling. Adaptive bitrate streaming systems may shift the bitrate of the audio/video content based on the network speed in an attempt to avoid stalling.

Joint Technology Stip. at 2 (Oct. 15, 2021), EDIS Doc. ID 754337.

The parties also stipulated to definitions of four terms from the asserted patents:

Bandwidth: the maximum rate of data transfer across a given network path.

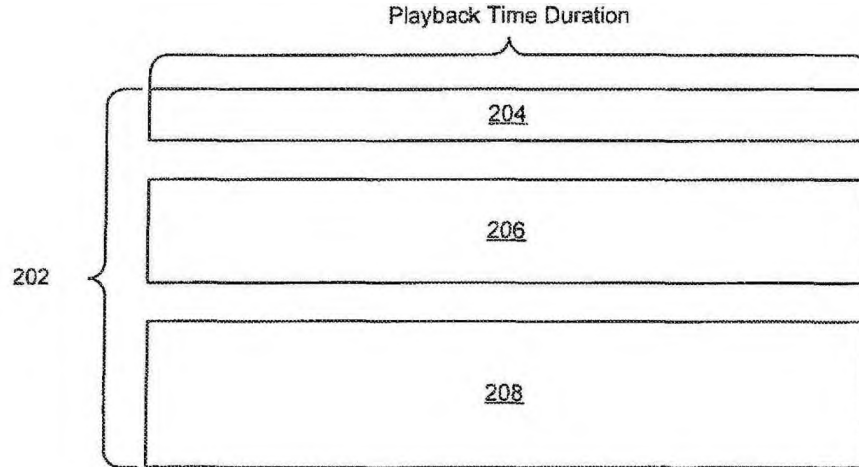
Bitrate: the amount of data (in bits) transferred per unit of time, such as one second.

TCP/IP: Transmission Control Protocol/Internet Protocol (TCP/IP) refers to the set of communication protocols used in the Internet and similar computer networks.

HTTP: Hypertext Transfer Protocol (HTTP) is an application layer protocol in the Internet protocol that allows the fetching of resources.

Id. at 3-4.

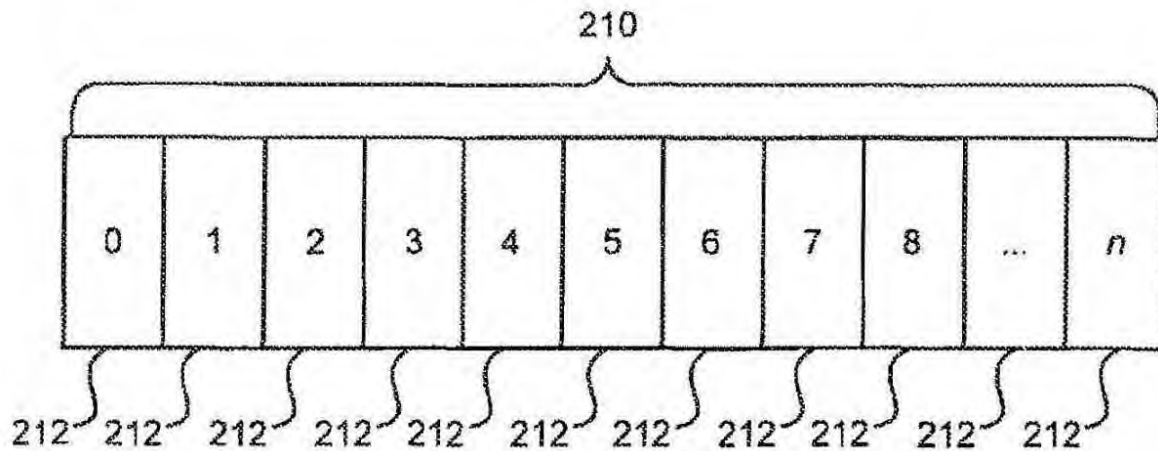
The asserted patents relate to “adaptive bitrate” streaming, which is a technique for delivering content, such as video, over the Internet. *See* JX-0001 (’564 patent) at 1:31-41. The adaptive bitrate streaming technology includes encoding the content file into at least three different “quality” streams, as shown in Figure 2b of the ’564 patent, reproduced below:



JX-0001 (’564 patent) at Fig. 2b.

As shown in Figure 2b, the plurality of streams 202 have varying degrees of quality and bandwidth, and include a low-quality stream 204, a medium-quality stream 206, and a high-quality stream 208. *See* JX-0001 (’564 patent) at 6:46-50. Each of the streams 204, 206, 208 is a copy of the content file encoded and compressed to varying bit rates. *See id.* at 6:51-52.

Each of the streams 204, 206, 208 (referred to generally as stream 210 in the figure below) is then further subdivided into discrete portions called “streamlets” 212, as shown in Figure 2c of the ’564 patent, reproduced below. *See id.* at 6:58-60.



JX-0001 (’564 patent) at Fig. 2c.

Each streamlet 212 comprises a portion of the content contained in stream 210. *See id.* at 6:61-62. Streamlets are aligned by starting time and duration across the different quality streams such that a particular streamlet in, *e.g.*, a low-quality stream and a medium-quality stream correspond to the same portion of the content file. *See id.* at 6:62-7:7. This allows end users to switch between different quality streamlets in response to changing network conditions.

Figure 7 of the ’564 patent depicts a method whereby the determination of which quality streamlets to use is based upon a factor relating to network performance:

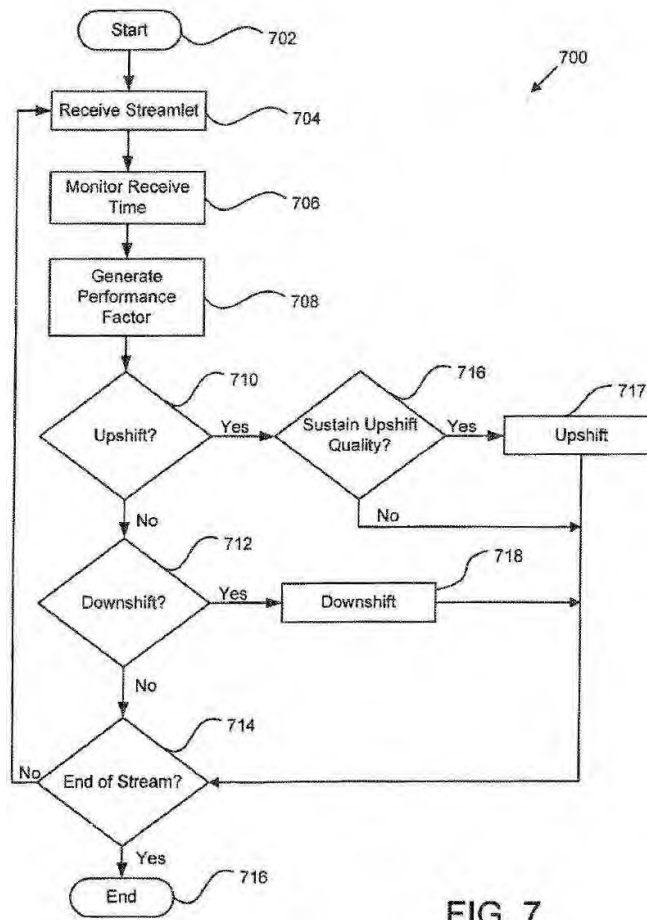


FIG. 7

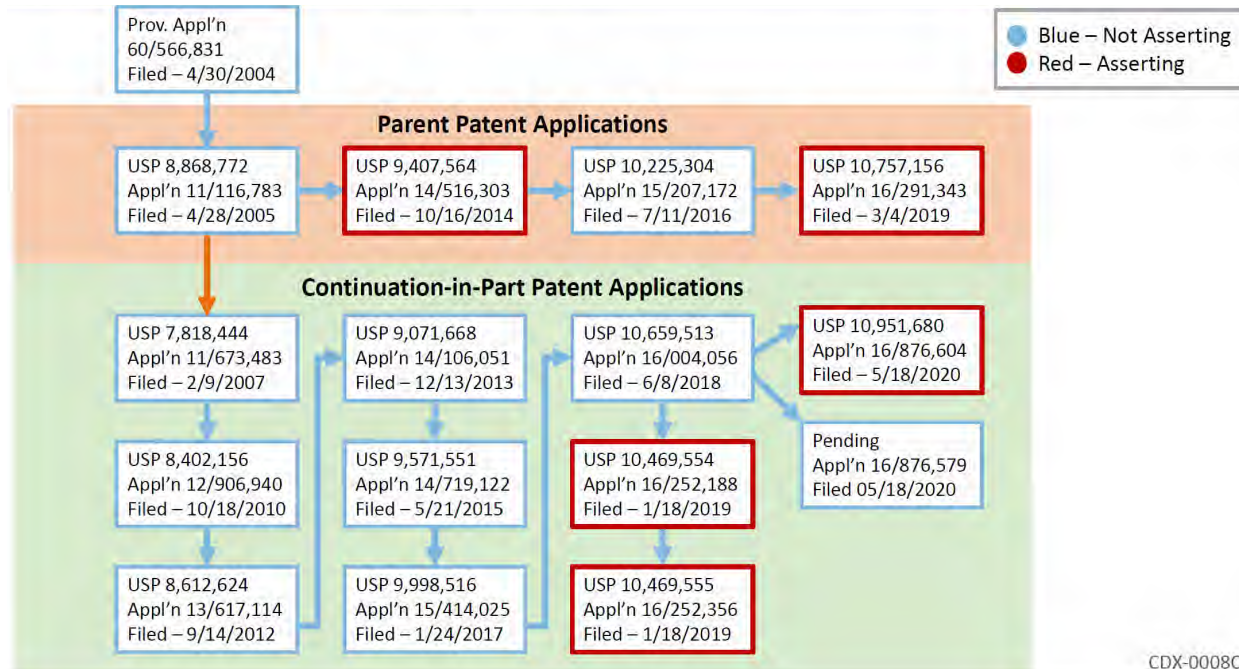
JX-0001 ('564 patent) at Fig. 7.

If the performance factor indicates that a higher-quality stream (comprised of higher-quality streamlets) can be used, for example, then the system shifts to the higher-quality stream. *See id.* at 12:53-60. If the factor indicates that a higher-quality stream cannot be used, then the system determines whether it should shift to a lower-quality stream, and if so, the system shifts to a lower-quality stream (and requests lower-quality streamlets). *See id.* at 14:65-15:8.

D. The Asserted Patents

DISH asserts four patents in this investigation: the '564 patent, the '156 patent, the '554 patent, and the '555 patent (collectively, the "asserted patents"). The asserted patents all claim

priority to U.S. App. No. 60/566,831, which was filed on April 30, 2004. *See* '564 patent at Cover; '156 patent at Cover; '554 patent at Cover; '555 patent at Cover; JX-0029 at 2. The following demonstrative illustrates the family of patents and patent applications that are related to the asserted patents:



CDX-0008C at 8; *see also* RDX-0001 (patent family map).¹ As can be seen in the figure above, the '564 and '156 patents issued from continuation applications claiming priority to the parent application for all the asserted patents, U.S. Application No. 11/116,783. The specifications of the '564 and '156 patents are similar, and may be referred to herein as the “continuation specification.” As can be seen in the figure above, the '554 and '555 patents issued from a continuation-in-part (“CIP”) application, U.S. Application No. 11/673,483. The specifications of the '554 and '555 patents are likewise similar and may be referred to herein as the “CIP specification.”

¹ As explained above in Section I.A, DISH is no longer asserting the '680 patent.

1. U.S. Patent No. 9,407,564

The '564 patent, titled "Apparatus, System, and Method for Adaptive-Rate Shifting of Streaming Content," issued on August 2, 2016, and names Robert Drew Major and Mark B. Hurst as inventors. '564 patent at cover page. The '564 patent issued from application no. 14/516,303, filed on October 16, 2014. *Id.*; *see* Compl. ¶ 5.6.

DISH asserts independent claim 1 and dependent claims 3-5 of the '564 patent. *See* Compls. Br. at 2. These claims read as follows:

- [1pre]** An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:
- [1a]** a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,
 - [1b]** wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,
 - [1c]** wherein each of the files yields a different portion of the video on playback,
 - [1d]** wherein the files across the different copies yield the same portions of the video on playback, and
 - [1e]** wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and
 - [1f]** wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;
 - [1g]** automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,
 - [1h]** the automatically requesting including repeatedly generating a

[REDACTED]

factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

[1i] making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and

[1j] presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

[3] The end user station of claim 1, wherein the media player is configured to generate the factor according to the responses to segment requests.

[4] The end user station of claim 1, wherein the media player is configured to upshift to the higher quality copy when the factor is greater than the first threshold and the media player determines the higher quality playback can be sustained according to a combination of factors.

[5] The end user station of claim 1 wherein the media player is configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player.

Id. at 13:20-61, 13:65-14:11. The limitations of claim 1 have been separated for clarity. *See generally* Compls. Br, Staff Br.

DISH relies on claims 1, 3 and 5 of the '564 patent to satisfy the technical prong of the domestic industry requirement. *See* Compls. Br. at 122.

2. U.S. Patent No. 10,757,156

The '156 patent, titled "Apparatus, System, and Method for Adaptive-Rate Shifting of Streaming Content," issued on August 25, 2020, and names Robert Drew Major and Mark B. Hurst

as inventors. '156 patent at cover page. The '156 patent issued from application no. 16/291,343, filed on March 4, 2019. *Id.*; see Compl. ¶ 5.8.

DISH asserts independent claim 1 and dependent claims 2, 4 and 5 of the '156 patent. *See* Compls. Br. at 2. These claims read as follows:

- [1pre]** An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising;
- [1a]** a media player operating on the apparatus, wherein the media player is configured to stream the video from the video server via at least one transmission control protocol (TCP) connection over the network,
 - [1b]** wherein the video server stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets,
 - [1c]** wherein each of the streamlets yields a different portion of the video on playback,
 - [1d]** wherein the streamlets across the different copies yield the same portions of the video on playback, and
 - [1e]** wherein the streamlets in the different copies are aligned in time such that the streamlets that play back the same portion of the video for the different copies each begin at the same playback time in relation to the beginning of the video, and
 - [1f]** wherein the media player streams the video by: requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server,
 - [1g]** wherein the sequential streamlets are selected by the media player from the based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video;
 - [1h]** repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video;
 - [1i]** adapting the successive determinations to shift the playback quality

based on the factor to achieve continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time; and

- [1j] presenting the video for playback by providing the requested streamlets in order of ascending start time.
- [2] The apparatus of claim 1, wherein the apparatus is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates.
- [4] The apparatus of claim 1, wherein the requesting the sequential streamlets comprises the apparatus transmitting hypertext transport protocol (HTTP) GET requests for selected streamlets, wherein each of the HTTP GET requests identifies the separate file stored by the video server that corresponds to the requested streamlet.
- [5] The apparatus of claim 1 wherein each of the streamlets of each of the different copies is independently requestable and playable by the apparatus.

Id. at 13:52-14:26, 14:30-38. The limitations of claim 1 have been separated for clarity. *See generally* Compls. Br, Staff Br.

DISH relies on claims 1 and 4 of the '156 patent to satisfy the technical prong of the domestic industry requirement. *See* Compls. Br. at 156.


3. U.S. Patent No. 10,469,554

The '554 patent, titled "Apparatus, System, and Method for Multi-Bitrate Content Streaming," issued on November 5, 2019, and names David F. Brueck, Mark B. Hurst, and R. Drew Major as inventors. '554 patent at cover page. The '554 patent issued from application no. 16/252,188, filed on January 18, 2019. *Id.*; *see* Compl. ¶ 5.11.

DISH asserts independent claim 16 and dependent claims 17 and 20 of the '554 patent. *See* Compls. Br. at 2. These claims read as follows:

[16pre] An end user station to stream a live event video over a network from a server for playback of the video, the content player device comprising:

[16a] a processor;

- 
- [16b] a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:
- [16c] establish one or more network connections between the end user station and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;
- [16d] wherein the live event video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream, each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the live event video;
- [16e] wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and
- [16f] wherein the first streamlets of each of the low quality stream, the medium quality stream and the high quality stream each has an equal playback duration and each of the first streamlets encodes the same portion of the live event video at a different one of the different bitrates;
- [16g] select a specific one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams;
- [16h] place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;
- [16i] receive the requested first streamlet from the server via the one or more network connections; and
- [16j] provide the received first streamlet for playback of the live event video.
- [17] The end user station of claim 16, wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the live event video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first

streamlet of the low quality stream.

[20] The end user station of claim 16, wherein the first streamlets of the low quality stream, the medium quality stream, and the high quality stream are available before the live event is complete.

Id. at 20:3-54, 20:60-63. The limitations of claim 16 have been separated for clarity. *See generally* Compls. Br, Staff Br.

DISH relies on claims 16 and 17 of the '554 patent to satisfy the technical prong of the domestic industry requirement. *See* Compls. Br. at 139.

4. U.S. Patent No. 10,469,555

The '555 patent, titled "Apparatus, System, and Method for Multi-Bitrate Content Streaming," issued on November 5, 2019, and names David F. Brueck, Mark B. Hurst, and R. Drew Major as inventors. '555 patent at cover page. The '555 patent issued from application no. 16/252,356, filed on January 18, 2019. *Id.*; *see* Compl. ¶ 5.13.

DISH asserts independent claim 10 and dependent claims 11, 14 and 15 of the '555 patent. *See* Compls. Br. at 2. These claims read as follows:

[10pre] A content player device to stream a video over a network from a server for playback of the video, the content player device comprising:

[10a] a processor;

[10b] a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

[10c] establish one or more network connections between the client module and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

[10d] wherein the video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream, wherein each of the low quality stream, the medium quality stream, and the high quality stream comprises a streamlet that encodes the same portion

of the video at a different one of the plurality of different bitrates;

- [10e] wherein at least one of the low quality stream, medium quality stream, and high quality stream is encoded at a bit rate of no less than 600 kbps; and
- [10f] wherein the streamlet encoding the same portion of the video in the low quality stream has an equal playback duration as the streamlet encoding the same portion of the video in the high quality stream;
- [10g] select a specific one of the streams based upon a determination by the client module to select a higher or lower bitrate version of the streams;
- [10h] place a streamlet request to the server over the one or more network connections for the selected stream;
- [10i] receive the requested streamlets from the server via the one or more network connections; and
- [10j] provide the received streamlets for playback of the video.
- [11] The content player device of claim 10 wherein each streamlet of the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream has a duration that is the same as each other.
- [14] The content player device of claim 10, wherein the video is a video of a live event.
- [15] The content player device of claim 14, wherein the streamlets of the low quality stream, the medium quality stream, and the high quality stream are available before the live event is complete.

Id. at 19:45-20:19, 20:28-33. The limitations of claim 10 have been separated for clarity. *See generally* Compls. Br, Staff Br.

DISH relies on claims 10, 11 and 14 of the '555 patent to satisfy the technical prong of the domestic industry requirement. *See* Compls. Br. at 151.

E. The Accused Products

The accused products in this investigation are “Internet-streaming enabled video displays and components thereof that are capable of using adaptive bit-rate streaming to stream content for

fitness devices, and fitness devices containing such internet-streaming video displays and components.” Compl., ¶ 4.1. The parties listed the accused products in a joint filing required by the procedural schedule. See Order No. 5 (requiring a “joint statement regarding identification of accused products”). By listing a product in the joint filing, respondents have not admitted infringement. Nevertheless, the joint filing indicates the final extent of DISH’s accusations in this investigation. See Joint Statement Regarding Identification of Accused Products (EDIS Doc. No. 755507).

1. Models Accused by DISH

DISH alleges that the respondents infringe certain claims of the asserted patents with respect to the following products:

Respondent(s)	Representative Product	Accused Product(s)
Peloton	Peloton Bike running Peloton application software available on April 13, 2021, as it operates when receiving on demand and live content in the format created, used, or provided by Peloton as of April 13, 2021	<p>The Peloton Bike running Peloton application software available on April 13, 2021, as it operates when receiving on demand and live content in the format created, used, or provided by Peloton as of April 13, 2021, is representative of Peloton Bike; Peloton Bike+; Peloton Tread; Peloton Tread+; Touchscreen [REDACTED] products running versions of Peloton application software available on April 13, 2021, as they operated when receiving on demand and live content in the format created, used, or provided by Peloton as of April 13, 2021, for purposes of determining infringement of the Accused Peloton Products when receiving on demand and live content in the format created, used, or provided by Peloton as of April 13, 2021, in this Investigation</p>

PUBLIC VERSION

Respondent(s)	Representative Product	Accused Product(s)
iFit	NordicTrack Commercial S15i running iFit application software available on April 13, 2021	NordicTrack Commercial S15i running iFit application software available on April 13, 2021 is representative, for the purposes of determining DISH's allegations of infringement in this Investigation, of ProForm Vue, NordicTrack Vault (complete), NordicTrack Vault (standalone), ProForm Studio Bike Pro, ProForm Studio Bike Pro 22, FreeMotion r22.9, FreeMotion u22.9, FreeMotion Coachbike, NordicTrack Commercial S15i, NordicTrack Commercial S22i, NordicTrack Commercial VR25, NordicTrack Commercial R35, NordicTrack Commercial VU 19, NordicTrack Commercial VU 29, ProForm R10, NordicTrack RW600, NordicTrack RW700, NordicTrack RW900, ProForm Carbon T7, ProForm Carbon T10, ProForm Pro 2000, ProForm Pro 9000, ProForm Carbon E7, ProForm Pro E14, ProForm Carbon HIIT H7, ProForm Carbon HIIT H14, FreeMotion i22.9, FreeMotion t22.9, FreeMotion e22.9 Elliptical, NordicTrack X22i, NordicTrack X32i, NordicTrack Commercial 1750, NordicTrack Commercial 2450, NordicTrack Commercial 2950, NordicTrack EXP 7i, NordicTrack EXP 10i, NordicTrack T 6.5 Si, NordicTrack FS10i, NordicTrack FS14i, NordicTrack Commercial 9.9, NordicTrack Commercial 14.9, and NordicTrack SpaceSaver SE9i products running iFit application software available on April 13, 2021

Respondent(s)	Representative Product	Accused Product(s)
iFit	NordicTrack Fusion CST Pro, if running iFit application software that was available on April 13, 2021	NordicTrack Fusion CST Pro, if running iFit application software that was available on April 13, 2021, is representative, for the purposes of determining DISH's allegations of infringement in this Investigation, of NordicTrack Fusion CST and NordicTrack Fusion CST Pro products running iFit application software available on April 13, 2021
MIRROR	MIRROR V1.0 product running MIRROR application software available for purchase in the United States on April 13, 2021	The MIRROR V1.0 product running MIRROR application software available for purchase in the United States on April 13, 2021, is representative of MIRROR V1.0 products running any version of MIRROR application software as of October 29, 2021, and is representative of MIRROR V1.1 products running any version of MIRROR application software as of October 29, 2021

See Joint Stipulation of DISH and Peloton as to Representative Products, at 1-2 (Oct. 29, 2021), (EDIS Doc. ID 755504); Joint Stipulation of DISH and iFIT as to Representative Products, at 1-2 (Oct. 29, 2021), (EDIS Doc. ID 755539); Joint Stipulation of DISH and MIRROR as to Representative Products, at 1 (Oct. 29, 2021), (EDIS Doc. ID 755525); Staff Br. at 16-21.

Additional background on the technology used in the accused products will be useful throughout the infringement analysis below.

2. Technology in the Accused Products

a) HTTP Live Streaming (HLS)

All of the accused products employ a protocol called HTTP Live Streaming (also known as HLS) to stream video from servers to viewers. Negus Tr. 118. HLS is an HTTP-based adaptive bitrate streaming communications protocol developed by Apple Inc. and released in 2009. CX-0836 (RFC 8216) at 1, 4. Support for the protocol is widespread in media players, web browsers, mobile devices, and streaming media servers. HLS incorporates mechanisms to adapt to unreliable network conditions without causing user-visible playback stalling. *See* CX-0836 (RFC 8216) at 1, 30. For example, on an unreliable wireless network, HLS allows transition to a lower quality video, thus reducing bandwidth usage. *See id.* at 5. HLS systems also can employ multiple servers for the same video. *See* RX-0004C (Snoeren RWS) at Q/A 25-26. If one of the servers fails, content from another server can be used, allowing a seamless transition from the viewer's perspective. *See id.*

HLS works by breaking a video stream into a sequence of small HTTP-based file downloads. *See* CX-0836 (RFC 8216) at 6, 38. Streams are encoded at different bit rates. *See id.* at 5. A list of available streams, called an extended M3U playlist, is sent to the client. *See id.* at 9.

The respondents' accused products employ HLS.

b) MPEG-DASH

Some of the accused products also employ a protocol called MPEG-DASH. *See* RX-0004C (Snoeren RWS) at Q/A 88-90. MPEG-DASH was the first adaptive bit-rate HTTP-based streaming solution to become an international standard. Like HLS, MPEG-DASH is an adaptive bitrate streaming technique that enables streaming of media content over the Internet.

[REDACTED]

See CX-0612 (ISO-IEC DASH) at 9. MPEG-DASH works in a similar way to HLS, by breaking the content into a sequence of small segments. *See id.* at 19-20. Each segment contains a short interval of content. *See id.* at 21. The content is made available at a variety of different bit rates. *See id.* at 22-24. While the content is being played back by an MPEG-DASH client, the client uses a bit rate adaptation (ABR) algorithm to automatically select the segment with the highest bit rate possible that can be downloaded in time for playback without causing stalls or re-buffering events in the playback. *See id.* Thus, an MPEG-DASH client can seamlessly adapt to changing network conditions and provide high quality playback with few stalls or re-buffering events.

MPEG-DASH uses existing HTTP web server infrastructure that is used for delivery of essentially all World Wide Web content. *See id.* at 9. It allows devices like Internet-connected televisions, TV set-top boxes, desktop computers, smartphones, tablets, etc., to consume multimedia content (video, TV, radio, etc.) delivered via the Internet, coping with variable Internet receiving conditions.

The MIRROR accused products employ MPEG-DASH for certain functionality.

c) MIRROR's HLS and MPEG-DASH Technology

The MIRROR accused products use both HLS and MPEG-DASH to stream content. The MIRROR accused products use [REDACTED] *See* RX-0008C (D'Ambrosio-Correll DWS) at Q/A 16-21, 24-29; RX-0004C (Snoeren RWS) Q/A 88-90. MIRROR's "On Demand" classes are recorded and then transmitted to [REDACTED] video files. *Id.*

In addition to denying infringement in general, MIRROR raises additional arguments specific to the alleged infringement of the MPEG-DASH functionality. *See, e.g.,* Resps. Br. at 61-62, 66, 69. Those arguments are addressed in the infringement analysis below.

d) Peloton's [REDACTED]

As noted in the chart above, DISH accuses Peloton products running versions of Peloton application software available on April 13, 2021. While the Peloton accused products employ HLS, Peloton has implemented a [REDACTED]

[REDACTED]. See RX-0004C (Snoeren RWS) at Q/A 69 (citing RX-0006C (Shanahan DWS) at Q/A 29-31); Shanahan Tr. at 208–211. Peloton requests adjudication of [REDACTED] as a design-around. See Resps. Br. at 22-25. DISH does not dispute whether [REDACTED] is within the scope of the investigations and in fact accuses Peloton of infringement based on that system. See *id.* at 93; *id.* at 103.

In determining whether a respondent has met its burden for adjudication of a design-around, the Commission considers four factors: (1) whether the product is within the scope of the investigation; (2) whether the product has been imported; (3) whether the design-arounds are sufficiently fixed in design, and; (4) whether the design-arounds have been sufficiently disclosed by respondent during discovery. See, e.g., *Certain Human Milk Oligosaccharides and Methods of Producing the Same*, Inv. No. 337-TA-1120, Comm'n Op. at 18 (June 8, 2020) (citing *Certain Two-Way Radio Equipment and Systems, Related Software and Components Thereof*, Inv. No. 337-TA-1053, Comm'n Op. (Nov. 16, 2018)).

Here, DISH accuses Peloton of infringing claims 1, 2, and 5 of the '156 patent and claims 10 and 11 of the '555 patent through implementation of [REDACTED], thus drawing [REDACTED] into the investigation. See *id.* at 93, 103. Peloton adduced evidence showing that [REDACTED] has been implemented and used with Peloton's imported accused products

since [REDACTED]. See RX-0006C (Shanahan DWS) at Q/A 30. Peloton further adduced evidence regarding the [REDACTED] [REDACTED]. See RX-0004C (Snoeren RWS) at Q/A 69-72; RX-0006C (Shanahan DWS) at Q/A 29-31. Moreover, Peloton disclosed details on [REDACTED] during discovery, including deposition testimony, documents and native files, interrogatory responses, and the expert report of Dr. Snoeren. CX-0180C (Peloton's Fifth Supplemental Interrogatory Responses) at 31-35; RX-0088C (sample class); RX-0089C (configuration file).

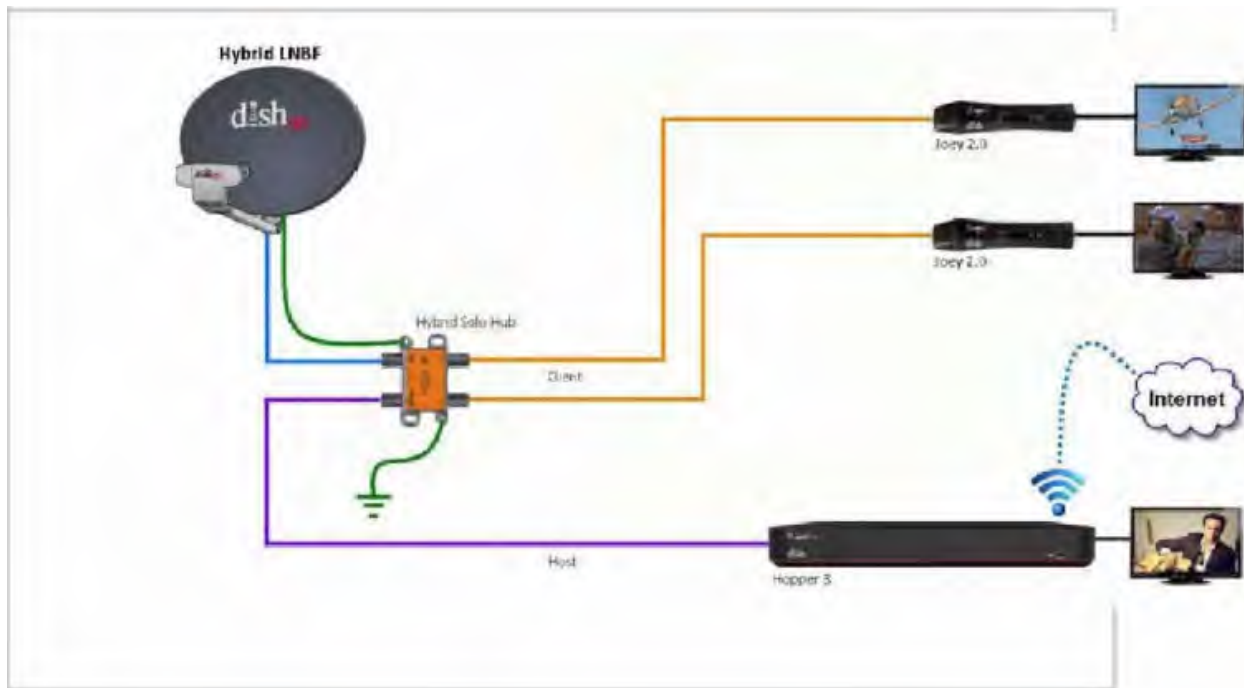
In view of the record evidence, I find the Peloton [REDACTED] is a fixed design that has been used with Peloton imported products since at least [REDACTED]. I also find [REDACTED] [REDACTED] has been sufficiently disclosed during discovery. I therefore find [REDACTED] [REDACTED] to be within the scope of the investigation and it will be included within the definition of accused products adjudicated in this final initial determination. See *Certain Human Milk Oligosaccharides*, Inv. No. 337-TA-1120, Comm'n Op. at 18.

F. The Domestic Industry Products

DISH contends that its set-top boxes practice the asserted domestic industry claims. See Compls. Br. at 117. These include the Hopper, Hopper with Sling, Hopper 3, Hopper Duo, and Wally products (collectively, DISH Set-Top Boxes). See *id.* DISH further contends the Sling TV Application ("Sling App") for the Amazon Fire, the Sling App for iOS, and the Sling App for Roku practice the asserted domestic industry claims. See *id.* at 120-21. DISH additionally argues that its "DISH TV" and "Sling TV" brands have a direct relationship to exploitation of the patented technology because they are the real-world manifestation of the patented technology. See *id.* at 6-7. DISH also avers that the domestic infrastructure and domestic workforce that DISH relies on

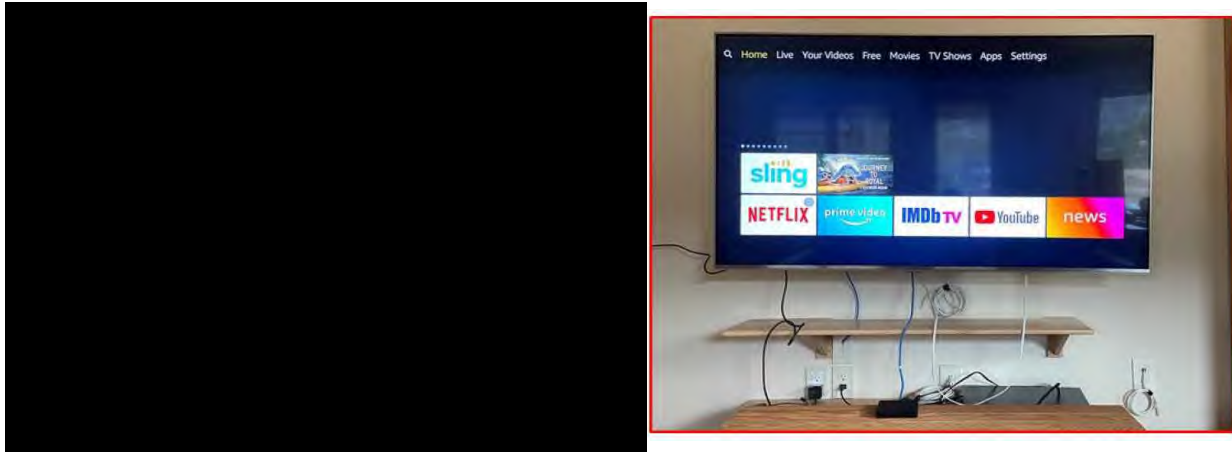
to provide these services “have a direct relationship to exploitation of the patented technology” because, without them, DISH could not deliver these services in the first instance. *See id.*

The DISH Set-Top Boxes function to provide both satellite-TV and Internet-streaming functionality to the user’s television or other display, as shown in the figure below. *See CX-0002C* (Kroonenberg DWS) at Q/A 53-54.



CX-0062 (Hopper Installation Guide) at 1.

The Sling App “delivers television programming and other content under the Sling TV brand, but solely via the Internet.” CX-0002C (Kroonenberg DWS) at Q/A 19. DISH provides the Sling App for a variety of different platforms, including the “Amazon Fire, Apple TV, Roku, Samsung Smart TV, LG Smart TV, and Xbox game console.” *Id.*



CX-0445C (Sling TV Overview) at 2; CDX-0010C.TEST.157.

To satisfy the domestic industry requirement, DISH further relies on: (1) the servers that segment and encode content into streamlets; (2) the servers that create manifests for these streamlets and publish them to content delivery networks; and (3) the servers within these content delivery networks that actually “serve” the streamlets to consumers. *See* Compl. Br. at 7-8.

II. JURISDICTION

A. Subject Matter Jurisdiction

Section 337 of the Tariff Act prohibits the importation, the sale for importation, or the sale after importation of articles that infringe a valid and enforceable patent if an industry exists in the United States relating to articles protected by the patent. 19 U.S.C. §§ 1337(a)(1)-(2). DISH’s complaint states a cause of action under section 337 by alleging that respondents Peloton, iFit, and MIRROR import, sell for importation, and sell after importation certain fitness devices, streaming components, and systems containing same that infringe the asserted patents. *See* Compl., ¶¶ 3.23-47. No party has contested the Commission’s subject matter jurisdiction over this investigation. I determine the Commission has subject matter jurisdiction over this investigation.

”); Resps. Br. at 25; *Sealed Air Corp. v. Int’l*

Trade Comm’n, 645 F.2d 976, 985–86 (C.C.P.A. 1981) (noting that the Commission has jurisdiction over imported goods).

III. STANDING

Respondents do not dispute DISH’s ownership of the asserted patents. *See* Resps. Br. at 25. The record evidence demonstrates that DISH has standing in this investigation due to its ownership of the asserted patents. *See* JX-0011 (’564 patent), JX-0012 (’554 patent), JX-0013 (’555 patent), and JX-0014 (’156 patent).

IV. IMPORTATION

As indicated in the notice of investigation, quoted above, this investigation was instituted to determine whether a violation of section 337 has occurred in “the importation into the United States, the sale for importation, or the sale within the United States after importation” of certain fitness products. *See* 86 Fed. Reg. 27106 (May 19, 2021); 19 U.S.C. § 1337(a)(1)(B) (making unlawful, in certain circumstances, the “importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles that . . . infringe a valid and enforceable United States patent . . .”). It has long been recognized that an importation of even one accused product can satisfy the importation requirement of section 337. *See Certain Trolley Wheel Assemblies*, Inv. No. 337-TA-161, Comm’n Op. at 7-8, USITC Pub. No. 1605 (Nov. 1984) (deeming the importation requirement satisfied by the importation of a single product of no commercial value).

In this investigation, it is uncontested that the importation requirement is satisfied with respect to all accused products. Each respondent has stipulated to the importation of accused products into the United States, and no respondent contests that the importation requirement of section 337 has been met. EDIS Doc. ID Nos. 758953, 758184, 756162; Resps. Br. at 25. With

[REDACTED]

respect to Peloton products using [REDACTED], Peloton admits products using that system have been imported into the United States since [REDACTED]. See RX-0006C (Shanahan DWS) at Q/A 30.

V. LEGAL PRINCIPLES

A. Claim Construction

Claim construction begins with the plain language of the claim.² Claims should be given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent.³ *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006).

The specification usually is the best guide to the meaning of the term. *Phillips*, 415 F.3d at 1315. As a general rule, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996). The specification is, however, always highly relevant to the claim construction analysis, and is usually dispositive. *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Moreover, “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Id.* at 1316.

² Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vanderlande Indus. Nederland BV v. Int’l Trade Comm’n*, 366 F.3d 1311, 1323 (Fed. Cir. 2004); *Vivid Tech., Inc. v. American Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

³ Factors that may be considered when determining the level of ordinary skill in the art include: “(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.” *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984).

Claims are not necessarily, and are not usually, limited in scope to the preferred embodiment. *RF Delaware, Inc. v. Pacific Keystone Techs., Inc.*, 326 F.3d 1255, 1263 (Fed. Cir. 2003); *Decisioning.com, Inc. v. Federated Dep't Stores, Inc.*, 527 F.3d 1300, 1314 (Fed. Cir. 2008) (“[The] description of a preferred embodiment, in the absence of a clear intention to limit claim scope, is an insufficient basis on which to narrow the claims).

B. Infringement

1. Direct Infringement

Under 35 U.S.C. § 271, direct infringement consists of making, using, offering to sell, selling, or importing a patented invention without consent of the patent owner. The complainant in a section 337 investigation bears the burden of proving infringement of the asserted patent claims by a “preponderance of the evidence.” *Enercon GmbH v. Int’l Trade Comm’n*, 151 F.3d 1376 (Fed. Cir. 1998).

Literal infringement of a claim occurs when every limitation recited in the claim appears in the accused device, *i.e.*, when the properly construed claim reads on the accused device exactly.⁴ *Amhil Enters., Ltd. v. Wawa, Inc.*, 81 F.3d 1554, 1562 (Fed. Cir. 1996); *Southwall Tech. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed Cir. 1995).

If the accused product does not literally infringe the patent claim, infringement might be found under the doctrine of equivalents. “Under this doctrine, a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is ‘equivalence’ between the elements of the accused product or process and the claimed

⁴ Each patent claim element or limitation is considered material and essential. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). If an accused device lacks a limitation of an independent claim, the device cannot infringe a dependent claim. *See Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1552 n.9 (Fed. Cir. 1989).

[REDACTED]

elements of the patented invention.” *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 21 (1997) (citing *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 609 (1950)). “The determination of equivalence should be applied as an objective inquiry on an element-by-element basis.”⁵ *Id.* at 40.

“An element in the accused product is equivalent to a claim limitation if the differences between the two are insubstantial. The analysis focuses on whether the element in the accused device ‘performs substantially the same function in substantially the same way to obtain the same result’ as the claim limitation.” *AquaTex Indus. v. Techniche Solutions*, 419 F.3d 1374, 1382 (Fed. Cir. 2005) (quoting *Graver Tank*, 339 U.S. at 608); accord *Absolute Software*, 659 F.3d at 1139-40.⁶

Prosecution history estoppel can prevent a patentee from relying on the doctrine of equivalents when the patentee relinquished subject matter during the prosecution of the patent, either by amendment or argument. *AquaTex*, 419 F.3d at 1382. In particular, “[t]he doctrine of prosecution history estoppel limits the doctrine of equivalents when an applicant makes a narrowing amendment for purposes of patentability, or clearly and unmistakably surrenders subject matter by arguments made to an examiner.” *Id.* (quoting *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1344 (Fed. Cir. 2005)).

⁵ “Infringement, whether literal or under the doctrine of equivalents, is a question of fact.” *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1130 (Fed. Cir. 2011).

⁶ “The known interchangeability of substitutes for an element of a patent is one of the express objective factors noted by *Graver Tank* as bearing upon whether the accused device is substantially the same as the patented invention. Independent experimentation by the alleged infringer would not always reflect upon the objective question whether a person skilled in the art would have known of the interchangeability between two elements, but in many cases it would likely be probative of such knowledge.” *Warner-Jenkinson*, 520 U.S. at 36.

2. Inducement of Infringement

Section 271(b) of the Patent Act provides: “Whoever actively induces infringement of a patent shall be liable as an infringer.” 35 U.S.C. § 271(b).

Under 35 U.S.C. § 271(b), whoever actively induces infringement of a patent shall be liable as an infringer. Liability for inducing infringement attaches if the defendant knew of the patent and that the induced acts constituted patent infringement. *Commil USA, LLC v. Cisco Sys., Inc.*, 575 U.S. 632, 638-39 (2015); *see also Microsoft Corp. v. Datatarn, Inc.*, 755 F.3d 899, 904 (Fed. Cir. 2014) (to prove induced infringement, patentee must show that accused inducer took an affirmative act to encourage infringement with knowledge that the induced acts constitute patent infringement); *Suprema, Inc. v. Int’l Trade Comm’n*, 796 F.3d 1338, 1346 (Fed. Cir. 2015) (the term infringement “encompasses both direct and indirect infringement, including infringement by importation that induces direct infringement of a method claim”).

C. Validity

One cannot be held liable for practicing an invalid patent claim. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). Nevertheless, each claim of a patent is presumed to be valid, even if it depends from a claim found to be invalid. 35 U.S.C. § 282; *DMI Inc. v. Deere & Co.*, 802 F.2d 421 (Fed. Cir. 1986).

A respondent that has raised patent invalidity as an affirmative defense must overcome the presumption by “clear and convincing” evidence of invalidity. *i4i Ltd. Partnership v. Microsoft Corp.*, 564 U.S. 91, 95 (2011).

1. Anticipation

A prior art reference anticipates a claimed invention when it discloses or contains all the claimed limitations “arranged or combined in the same way as in the claim.” *Wm. Wrigley Jr. Co.*

[REDACTED]

v. Cadbury Adams USA LLC, 683 F.3d 1356, 1361 (Fed. Cir. 2012). However, the reference “need not satisfy an *ipsissimis verbis* test.” *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009). Anticipation under 35 U.S.C. § 102 is a question of fact. *z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1347 (Fed. Cir. 2007).

2. Obviousness

Under Section 103 of the Patent Act, a patent claim is invalid “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”⁷ 35 U.S.C. § 103 (pre-AIA). While the ultimate determination of whether an invention would have been obvious is a legal conclusion, it is based on “underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness.” *Eli Lilly and Co. v. Teva Pharmaceuticals USA, Inc.*, 619 F.3d 1329 (Fed. Cir. 2010).

Objective evidence of nonobviousness, also known as “secondary considerations,” includes commercial success, long felt need, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006). “[E]vidence arising out of the so-called ‘secondary considerations’ must always when present be considered en route to a determination of obviousness.” *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). Secondary considerations, such as

⁷ The standard for determining whether a patent or publication is prior art under section 103 is the same as under 35 U.S.C. § 102, which is a legal question. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987).

commercial success, may not be dispositive in the obviousness analysis. *See, e.g., KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 426 (2007) (commercial success did not alter conclusion of obviousness).

In raising an obviousness defense, “the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable expectation of success in doing so.” *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 416 (a combination of elements must do more than yield a predictable result; combining elements that work together in an unexpected and fruitful manner would not have been obvious).⁸

3. Indefiniteness

Paragraph 2 of Section 112 of the Patent Act requires that the patent claims particularly point out and distinctly claim the subject matter that the patentee regards to be the invention. *See* 35 U.S.C. § 112, ¶ 2 (pre-AIA). A patent claim is invalid for indefiniteness if it fails to inform those skilled in the art about the scope of the invention “with reasonable certainty” when it is viewed in light of the specification and prosecution history. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). An accused infringer has the burden of proving indefiniteness by clear and convincing evidence. *BASF Corp. v. Johnson Matthey Inc.*, 875 F.3d 1360, 1365 (Fed. Cir. 2017).

⁸ Further, “when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious.” *KSR*, 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 52 (1966)).

4. Inventorship

Section 116 of the Patent Act provides the standard for joint inventorship:

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.

35 U.S.C. § 116.

“Because conception is the touchstone of inventorship, each joint inventor must generally contribute to the conception of the invention.” *Ethicon, Inc. v. U.S. Surgical Corp.*, 135 F.3d 1456, 1460 (Fed. Cir. 1998). Conception exists “when a definite and permanent idea of an operative invention, including every feature of the subject matter sought to be patented, is known.” *Sewall v. Walters*, 21 F.3d 411, 415 (Fed. Cir. 1994). In other words, conception is only complete when the “idea is so clearly defined in the inventor's mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation.” *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994).

Inventorship is a question of law based on underlying factual determinations. *Vapor Point LLC v. Moorhead*, 832 F.3d 1343, 1348 (Fed. Cir. 2016).

5. Inequitable Conduct

“To prevail on a claim of inequitable conduct, the accused infringer must prove that the patentee acted with the specific intent to deceive the PTO.” *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1290 (Fed. Cir. 2011) (*en banc*). “In other words, the accused infringer must prove by clear and convincing evidence that the applicant knew of the reference, knew that it was material, and made a deliberate decision to withhold it.” *Id.* “[T]o meet the clear and

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convincing evidence standard, the specific intent to deceive must be the single most reasonable inference able to be drawn from the evidence,” and thus, “when there are multiple reasonable inferences that may be drawn, intent to deceive cannot be found.” *Id.* at 1290-91 (citations omitted). “Intent and materiality are separate requirements,” and thus a court “may not infer intent solely from materiality. Instead, a court must weigh the evidence of intent to deceive independent of its analysis of materiality.” *Id.* at 1290. “The absence of a good faith explanation for withholding a material reference does not, by itself, prove intent to deceive.” *Id.* at 1291.

D. Domestic Industry

For a patent-based complaint, a violation of section 337 can be found “only if an industry in the United States, relating to the articles protected by the patent . . . concerned, exists or is in the process of being established.” 19 U.S.C. § 1337(a)(2). The complainant bears the burden of establishing that the domestic industry requirement is satisfied. *John Mezzalingua Assocs., Inc. v. Int’l Trade Comm’n*, 660 F.3d 1322, 1331 (Fed. Cir. 2011). The domestic industry requirement of section 337 is often described as having an economic prong and a technical prong. *InterDigital Commc’ns, LLC v. Int’l Trade Comm’n*, 707 F.3d 1295, 1298 (Fed. Cir. 2013); *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm’n Op. at 12-14, USITC Pub. No. 4120 (Dec. 2009).

1. Economic Prong

Section 337(a)(3) sets forth the following economic criteria for determining the existence of a domestic industry in such investigations:

(3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned –

- (A) significant investment in plant and equipment;
- (B) significant employment of labor or capital; or
- (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3). Because the statutory criteria are listed in the disjunctive, satisfaction of any one of them will be sufficient to meet the economic prong of the domestic industry requirement. *See InterDigital Commc'ns*, 707 F.3d at 1303 n.4; *Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, Comm'n Op. at 15, USITC Pub. No. 3003 (Nov. 1996).

2. Technical Prong

The technical prong of the domestic industry requirement is satisfied when the complainant in a patent-based section 337 investigation establishes that it is practicing or exploiting the patents at issue. *See* 19 U.S.C. § 1337(a)(2) and (3); *Certain Microsphere Adhesives, Process for Making Same and Prods. Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm'n Op. at 8, USITC Pub. No. 2949 (Jan. 1996). “The test for satisfying the ‘technical prong’ of the industry requirement is essentially [the] same as that for infringement, *i.e.*, a comparison of domestic products to the asserted claims.” *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). To prevail, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more valid claims of the patent. *See id.*; *Spancion*, 629 F.3d at 1349; *Certain Vision-Based Driver Assistance System Cameras and Components Thereof*, Inv. No. 337-TA-907, Comm'n Op. at 36, USITC Pub. No. 4866 (Feb. 2019). It is sufficient to show that the products practice any claim of that patent, not necessarily an asserted claim of that patent. *See Certain Male Prophylactic Devices*, Inv. No. 337-TA-546, Comm'n Op. at 38, USITC Pub. No. 4005 (May 2008).

VI. LEVEL OF ORDINARY SKILL IN THE ART

DISH contends a person of ordinary skill in the art at the time of invention of each of the asserted patents would have at least a bachelor's degree in electrical engineering or computer science, or an equivalent degree or experience in a related field, with at least two years of practical experience or coursework in the design or development of distributed multimedia delivery systems. *See* Compl. Br. at 9 (citing CX-0008C (Jeffay RWS) at Q/A 23; CX-0010C (Negus DWS) at Q/A 16; RX-0001C (Richardson DWS) at Q/A 117).

Respondents submitted the following proposal: “[S]omeone with at least a bachelor’s degree in electrical engineering or computer science, or an equivalent degree or experience in a related field, with practical experience or coursework in the design or development of network-based communication between computer systems.” Resps. Br. at 27 (quoting RX-0001C (Richardson DWS) at Q/A 117).

The Staff contends that there does not appear to be a material difference between the private parties’ proposals, but finds that DISH’s proposed definition is more appropriate because practical experience or coursework in the design or development of distributed multimedia delivery systems more closely aligns with the technology at issue. *See* Staff Br. at 38.

No party has explained how any proposed differences in an ordinary artisan’s skill are material to this investigation. To the extent a finding on the ordinary level of skill in the art is necessary, I adopt DISH’s description of the ordinary artisan in this field. *Cf. Genzyme Therapeutic Prod. Ltd. P’ship v. Biomarin Pharm. Inc.*, 825 F.3d 1360, 1372 (Fed. Cir. 2016) (failure to make a specific finding about the required level of skill in the art is not reversible error where the record did not show any meaningful differences in proposed definitions or that the outcome of the case would have been different based on which definition was selected). DISH’s



proposal accords with Dr. Jeffay’s knowledge of colleagues and others working in those fields as of and for several years before the applicable time frame, and the types of problems encountered in the art. *See* CX-0008C (Jeffay RWS) at Q/A 25. Respondents’ proposal has not been demonstrated to differ in any material way, and respondents’ expert did not provide substantive explanation justifying his proposal. *See* RX-0001C (Richardson DWS) at Q/A 117.

VII. CLAIM CONSTRUCTION

A. Agreed Constructions

Pursuant to Ground Rule 6.d, the parties filed a Joint Claim Construction Chart (“JCCC”) on September 22, 2021. JX-0016. In that submission, the parties agreed that the preamble for claim 1 of the ’564 patent is limiting in its entirety. *See id.* at 1.⁹

B. Disputed Constructions¹⁰

1. “streamlet(s)” (’554 patent, claims 16, 17, and 20; ’555 patent, claims 10, 11, and 15; ’156 patent, claims 1, 2, 4, and 5)

Below is a chart showing the parties’ proposed claim constructions.

DISH’s Proposed Construction	Respondents’ Proposed Construction	The Staff’s Proposed Construction
any sized portion(s) of the content file	any sized portion of a content file each of which is stored separately	any sized portion(s) of the content file

See JX-0016 at 3.

⁹ As stated in the JCCC, the parties agreed that the preambles to both claims 1 and 8 of the ’564 patent are limiting in their entirety. However, DISH is no longer asserting claim 8 of the ’564 patent. *See supra* Sec. I.A.

¹⁰ This section addresses only the claim terms identified by the parties as needing construction under Ground Rule 11. *See* Ground Rule 11 (attached to Order No. 2 (Ground Rules)); Comprehensive Joint Outline of Issues (EDIS Doc. Nos. 767242, 768188) (“GR11 Filing”).

The dispute between the parties is whether a streamlet can be a portion of the content file—no matter the size of the portion or how it is stored—or whether streamlets must be separately stored portions of the content file.

The terms “streamlet” or “streamlets” appear in independent claim 16 and dependent claims 17 and 20 of the ’554 patent (JX-0002 (’554 patent) at claims 16, 17, 20); independent claim 10 and dependent claims 11 and 15 of the ’555 patent (JX-0003 (’555 patent) at claims 10, 11, 15); and independent claim 1 and dependent claims 2, 4 and 5 of the ’156 patent (JX-0004 (’156 patent) at claims 1, 2, 4, 5).

For the reasons provided below, a “streamlet” will be construed to be “any sized portion of the content file.” This construction is consistent with the unambiguous lexicography in the patent specifications, which states: “As used herein, streamlet refers to any sized portion of the content file 200.” *See* JX-0004 (’156 patent) at 7:11-12; JX-0002 (’554 patent) at 7:39-40 (same).

Respondents’ proposed construction, which requires streamlets to be stored separately, is undermined by at least one other patent claim which expressly recites that requirement. Specifically, dependent claim 7 of the ’156 patent adds an additional limitation to the streamlets of claim 1, requiring that “each of the streamlets in each of the plurality of different copies is a separate file stored by the video server.” JX-0004 (’156 patent) at claim 7. Because respondents’ proposed construction would render at least portions of claim 7 superfluous, it is not favored. *See InterDigital Commc’ns, LLC v. Int’l Trade Comm’n*, 690 F.3d 1318, 1324-25 (Fed. Cir. 2012).

Respondents argue that the patentees limited the meaning of a streamlet under the doctrine of prosecution history disclaimer. *See* Resps. Br. at 29. Respondents point to statements made by the applicant during the prosecution of U.S. Pat. App. No. 11/116,783 (“the ’783 Application”), the predecessor application to all of the asserted patents. *See id.; supra* Sec. I.D. During

prosecution of the '783 Application, the applicants distinguished a prior art reference called Birney by arguing the reference “discloses combining several different video streams into one Windows media stream.” *Ex Parte R. Drew Major and Mark B. Hurst*, Appeal Brief, 2011 WL 12464422 (April 18, 2011) (discussing the reference “Intelligent Streaming,” Bill Birney, May 2003, Microsoft (“Birney”)). The applicants noted that the single encoded video stream of Birney does not constitute “a plurality of commonly-indexed files for each of the different copies of the video,” as was required in the then-pending claim. *Id.* The Board agreed, stating that the cited portions of the Birney reference fail to show “different copies of the video are stored as multiple files” and instead discloses audio and video streams “encoded into a *single* Windows Media stream.” *Ex Parte R. Drew Major and Mark B. Hurst*, No. 2011-008734, 2014 WL 3840509, at *2 (P.T.A.B. July 21, 2014) (emphasis in original). The Board elaborated that because the audio and video streams of Birney “are encoded into a single stream, they are not stored as multiple files as the claim limitation requires.” *Id.*

Thus, in the '783 Application, the applicants distinguished Birney from claim language requiring “copies of the video,” a different term and a different concept from “streamlets.” Claims 1 and 7 of the '156 patent confirm the distinction between these two concepts. Claim 1 recites “streamlets *in* the different copies” of the video, and claim 7 similarly recites streamlets “*in* each of the plurality of different copies.” JX-0004 ('156 patent) at claims 1, 7 (emphasis added). In addition, the '156 patent specification indicates that “[e]ach streamlet may further comprise a portion of a content file.” *Id.* at 3:19-20; *see also id.* at 7:12-14. In contrast, the cited passages from the '783 Application record do not discuss the term streamlet or indicate in any way that streamlets themselves must be stored in separate files. There are no “clear and unmistakable

statements by the patentee that limit the claims” in the manner respondents suggest. *See GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014).

Respondents further argue that, during prosecution of U.S. App. No. 14/516,303 (“the ’303 Application”), which issued as the ’564 patent, the applicant (1) replaced the word “streamlet” with “file” in certain proposed claims, and (2) distinguished the Birney prior reference described above from the invention, in which copies of the video are “stored as multiple files.” Resps. Br. at 29-30. Neither argument limits the scope of the term “streamlet.”

First, in replacing the word “streamlet” with “file” in certain proposed claims, the applicant was responding to a non-final rejection under 35 U.S.C. § 112, second paragraph, where the examiner noted that “the phrase ‘streamlet’ is unclear as to what makes up a streamlet.” JX-0006 (’564 Patent FH) at 312. In response, the applicant stated that “the word ‘streamlet’ is consistently used throughout our specification to refer to a segment of a video stream.” *Id.* at 405 (citing Figure 2c and accompanying text). The examiner similarly noted an understanding that “[f]or the furthering of prosecution, the phrase will be taken to mean a packet or segment.” *Id.* at 312. Thus, both the examiner and the applicant described a streamlet in a manner substantially similar to DISH’s argument here.

Additionally, in replacing the word “streamlet” with “file,” the applicant did not define all streamlets as separate files but instead chose to focus on an embodiment of the invention in which streamlets were separate files “in the interest of advancing prosecution” of that particular application. JX-0006 (’564 Patent FH) at 405-06. The applicant did not disclaim the broader disclosure in the specification common to all of the asserted patents that “[e]ach streamlet may further comprise a portion of a content file.” JX-0004 (’156 patent) at 3:19-20.

[REDACTED]

As for the characterization of Birney in the '303 Application record, the patentees' arguments concerning Birney do not refer to "streamlets" at all as the term had been eliminated from the pending claims. The patentees merely stated that Birney fails to disclose "each of a plurality of different copies of the video encoded at different bit rates is stored as multiple files." JX-0006 ('564 Patent FH) at 405-06. As noted above, the discussion of Birney in the '783 Application history addresses "copies of the video," a different term and a different concept from "streamlets." *See* 2014 WL 3840509, at *2. The cited prosecution history from the '303 Application does not contain a clear and unmistakable disclaimer of the scope of the term "streamlet." *See GE Lighting Sols.*, 750 F.3d at 1309.

Respondents also cite the prosecution of U.S. Pat. App. No. 15/207,172 ("the '172 Application"), characterizing the record as containing an argument by the patentee that "Birney did not disclose 'multiple sets of streamlets' based on the Board's decision that Birney did not disclose video 'stored as multiple files.'" Resps. Br. at 30 (quoting RX-0171 at 191). The passage cited is much more vague than might be inferred from respondents' selective quotations. In it, the applicants explained that they moved the phrase "multiple sets of streamlets" from the preamble to the body of the proposed claim to clarify that the limitation is "an affirmative recitation of the claim." RX-0171 at 191. The applicants stated that at least this language distinguishes the invention over the prior art, and then, in a "*see*" signal citation, identified the 2014 Board Decision which addressed the Birney reference. *Id.* Nothing in this passage manifests a "clear and unmistakable" intent to limit the scope of "streamlets."

The construction proposed by DISH and the Staff comports with the language of the claims and the definition of "streamlet" given in the specification, and it is not contradicted by the



prosecution history of any related patent application. Accordingly, the disputed claim term “streamlet” is construed to mean “any sized portion of the content file.”

2. “place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections” (’555 patent, claim 10)

Below is a chart showing the parties’ proposed claim constructions.

DISH’s Proposed Construction	Respondents’ Proposed Construction	The Staff’s Proposed Construction
Plain and ordinary meaning (<i>e.g.</i> , request a plurality of streamlets over the one or more network connections for the selected stream; and receive the requested streamlets from the server via the one or more network connections)	request a plurality of streamlets simultaneously over the one or more network connections for the selected stream; and subsequently receive the plurality of streamlets from the server via the one or more network connections	Plain and ordinary meaning (<i>e.g.</i> , request a plurality of streamlets over the one or more network connections for the selected stream; and receive the requested streamlets from the server via the one or more network connections)

See JX-0016 at 3.

The dispute between the parties is whether the claimed “streamlet request” must be “a single request for multiple streamlets simultaneously,” as respondents contend (Resps. Br. at 32), or whether the “streamlet request . . . [for] the requested streamlets” would also be satisfied by serial, non-simultaneous requests for a plurality of streamlets, as DISH and the Staff argue.

For the reasons discussed below, the phrases in question will be construed according to their plain and ordinary meaning, which may be satisfied by a request for a single streamlet.

The disputed language appears in independent claim 10 of the ’555 patent. JX-0003 (’555 patent) at claim 10. Claim 10 provides “substantial guidance as to the meaning of” the phrases in question. *See Phillips*, 415 F.3d at 1314. Claim 10 recites, in part:

place a streamlet request to the server over the one or more network connections for the selected stream;

receive the requested streamlets from the server via the one or more network connections . . .

JX-0003 ('555 patent) at claim 10.

As can be seen, claim 10 requires “a streamlet request . . . for the selected stream” but it contains no requirement as to the number of streamlets of the selected stream that must be included in the request. Respondents admit the patent specification teaches the request may be for one streamlet or multiple streamlets. Resps. Br. at 32 (“The parties and the Staff agree that the specification discloses different embodiments, including: (1) one in which a single request is placed for a single streamlet, and (2) another in which a single request is placed for multiple streamlets simultaneously.”). The ordinary meaning of the phrase “place a streamlet request . . . for the selected stream” is broad enough to cover both scenarios in the specification, and “neither the claims nor the specification . . . require a departure from this ordinary meaning.” *See Network-1 Techs., Inc. v. Hewlett-Packard Co.*, 981 F.3d 1015, 1024 (Fed. Cir. 2020) (where the specification described embodiments with AC power sources and embodiments with DC power sources, a claim requiring a “power source” could be satisfied by either).

Respondents contend that because the “receive” step of claim 10 speaks of “requested streamlets” in the plural, then the earlier “request” must necessarily be for multiple streamlets. But given the teachings of the specification, the “receive” step is more properly interpreted as “receive one or more requested streamlets.” This conclusion is consistent with the idiomatic use of the plural in this context, which “can describe a universe ranging from one to some higher number.” *See Versa Corp. v. Ag-Bag Int’l Ltd.*, 392 F.3d 1325, 1330 (Fed. Cir. 2004) (a claim requiring a “means for creating air channels” in the plural “does not imply that multiple channels are required

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by the claim”); *Dayco Prod., Inc. v. Total Containment, Inc.*, 258 F.3d 1317, 1328 (Fed. Cir. 2001) (a claim requiring “projections with recesses therebetween” should be construed to cover “a single recess where there are only two projections”).

Respondents further argue that their construction is supported by differing language in claim 16 of the ’554 patent, in which the “receive” step uses the term “streamlet” in the singular:

place a streamlet request to the server over the one or more network connections
for the first streamlet of the selected stream;

receive the requested first streamlet from the server via the one or more network
connections;

See JX-0002 (’554 patent), claim 16; Resps. Br. at 33. However, the applicability of claim differentiation is at its weakest when it is based on a comparison to another independent claim. *See, e.g., Atlas IP, LLC v. Medtronic, Inc.*, 809 F.3d 599, 607 (Fed. Cir. 2015) (discounting the doctrine of claim differentiation “where it is invoked based on independent claims rather than the relation of an independent and dependent claim.”). Patentees are entitled to “use different language to capture the same invention” in independent claims. *Id.* Here, respondents admit that the specification clearly teaches the embodiment they seek to exclude (Resps. Br. at 32), and the ordinary meaning of the claim language covers that embodiment. In this context, the comparison to claim 16 of the ’554 patent—an independent claim in another patent—is not persuasive.

The limitations “place a streamlet request to the server over the one or more network connections for the selected stream” and “receive the requested streamlets from the server via the one or more network connections” will be given their ordinary meaning.

3. “quality” terms: “low/medium/high quality stream” (’554 patent, claims 16, 17, and 20; ’555 patent, claims 10, 11, and 15)

Below is a chart showing the parties’ proposed claim constructions.

Term	DISH’s Proposed Construction	Respondents’ Proposed Construction	The Staff’s Proposed Construction
low quality stream	Plain and ordinary meaning (<i>e.g.</i> , encoded at a bitrate/quality that is lower than the “medium” and “high” quality streams)	Indefinite	“a stream encoded and compressed to a bit rate that is lower than a medium quality stream (<i>i.e.</i> , a bit rate between approximately 0 and 100 kilobits per second)”
medium quality stream	Plain and ordinary meaning (<i>e.g.</i> , encoded at a bitrate/quality level that is higher than the “low” and lower than the “high” quality stream)	Indefinite	“a stream encoded and compressed to a bit rate that is lower than a high quality stream and higher than a low quality stream (<i>i.e.</i> , a bit rate between approximately 100 and 600 kilobits per second)”
high quality stream	Plain and ordinary meaning (<i>e.g.</i> , encoded at a bitrate/quality level that is higher than the “low” and “medium” quality streams)	Indefinite	“a stream encoded and compressed to a bit rate that is higher than a medium quality stream (<i>i.e.</i> , a bit rate of approximately 600 kilobits per second or faster)”

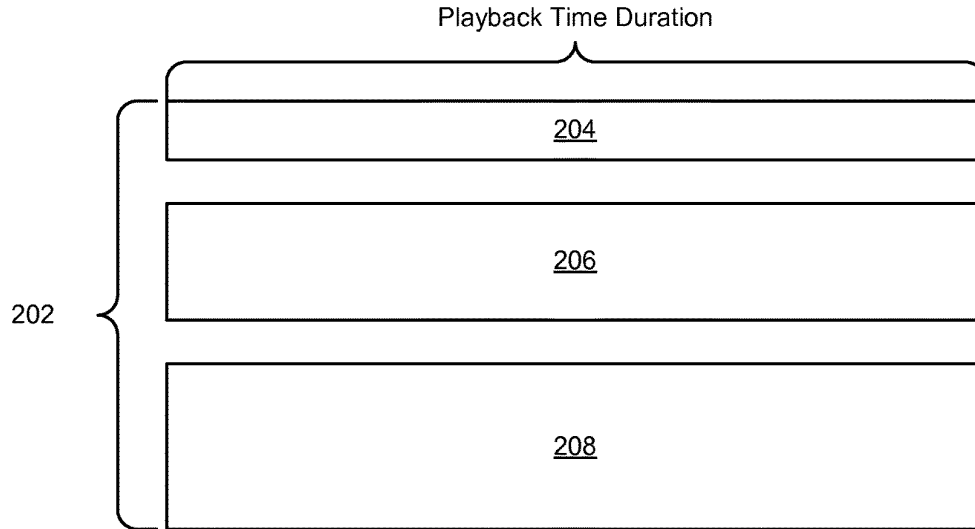
See JX-0016 at 5-6.

The quality terms appear in independent claim 16 and dependent claims 17 and 20 of the '554 patent, and in independent claim 10 and dependent claims 11 and 15 of the '555 patent. JX-0002 ('554 patent) at claims 16, 17, 20; JX-0003 ('555 patent) at claims 10, 11, 15.

The parties dispute whether these quality terms are indefinite, and, if not indefinite, whether certain numerical ranges are required to define each term. For the reasons discussed below, I have determined that the terms “low quality stream,” “medium quality stream,” and “high quality stream” have not been shown to be indefinite and should be construed to have their plain and ordinary meaning.

a) Definiteness

The CIP specification of the '554 and '555 patents describes a low-quality video stream 204, a medium-quality video stream 206, and a high-quality video stream 208. Figure 2b of those patents illustrates the connection bandwidth required for each stream quality, with the low-quality stream 204 represented by a narrow block, the medium-quality stream 206 represented by a wider block, and the high-quality stream represented by the widest block:



JX-0002 (FIG. 2b

The CIP specification goes on to explain:

Each of the streams 204, 206, 208 is a copy of the content file 200 encoded and compressed to varying bit rates. For example, the low quality stream 204 may be encoded and compressed to a bit rate of 100 kilobits per second (kbps), the medium quality stream 206 may be encoded and compressed to a bit rate of 200 kbps, and the high quality stream 208 may be encoded and compressed to 600 kbps.

JX-0002 ('554 patent) at 7:30-36. The CIP specification discloses that an agent controller module will upshift or downshift between the different quality streams based upon a determination as to the available bandwidth of the viewer's internet connection. *See id.* at 17:55-18:14.

Each time the low-quality, medium-quality, and high-quality streams are referenced in the CIP specification, they are used in a relative sense to one another. *See, e.g.,* JX-0002 ('554 patent) at 7:25-36, 8:57-67; *see also id.* at claims 1, 2, 4, 7-10, 12, 16, 17, 20-22, 24, 26-27, 29-30; JX-0003 ('555 patent) at claims 1-4, 7-13, 15-27. The CIP specification identifies a 600 kbps-encoded stream as an example of a high-quality stream, and it gives numerical examples of bitrates for medium-quality and low-quality streams in comparison. *See* '554 patent at 7:30-36; '555 patent

at 7:30-36. These teachings in the CIP specification inform the ordinary artisan as to whether a given stream falls within one of the quality categories defined in the claims. *See Sonix Tech. Co. v. Publications Int’l, Ltd.*, 844 F.3d 1370, 1378 (Fed. Cir. 2017) (“the written description is key to determining whether a term of degree is indefinite”).

The claims themselves also inform the meaning of the quality categories. *See Phillips*, 415 F.3d at 1314. Claim 16 of the ’554 patent expressly ties stream quality to bitrate by specifying that each of the three streams contains the same live video event “encoded at a plurality of different bitrates.” ’554 patent at claim 16. Claim 16 also quantifies a threshold for a high quality stream: it must have “a bit rate of no less than 600 kbps.” *Id.* Claim 10 of the ’555 patent similarly states that each of the three streams contains the same video “encoded at a plurality of different bitrates” and the high quality stream must be “encoded at a bit rate of no less than 600 kbps.” JX-0003 (’555 patent) at claim 10. The claims therefore provide an objective scale for understanding quality (bitrate), a reference point on that scale (600 kbps and above for high quality), and easily understood descriptors for different quality categories along the scale (low, medium, and high).

Finally, the record contains evidence that a person of ordinary skill in the art would understand that a low-quality stream is encoded at a lower bitrate than a medium-quality stream and a high-quality stream, and that a high-quality stream is encoded at a higher bitrate than a low-quality stream and a medium-quality stream. *See CX-0008C (Jeffay RWS)* at Q/A 381.

Despite the teachings of the specification, the clear language of the claims, and the record evidence noted above, respondents contend that the claims are indefinite, arguing that “they are subjective, context-dependent adjectives with no objective definition . . .” Resps. Br. at 43-44. But context-dependent adjectives are not necessarily subjective; they can still provide notice of the metes and bounds of a claim with reasonable certainty. Indeed, the Federal Circuit has expressly

“rejected the proposition that claims involving terms of degree are inherently indefinite.” *Sonix Tech.*, 844 F.3d at 1377.

In the *Sonix* case, for example, the Federal Circuit held that the term “visually negligible” was not subjective and not indefinite because the question of whether something interferes with a user’s perception can be measured against “what can be seen by the normal human eye,” an objective reference point. *Id.* at 1378. Claim 16 of the ’554 patent and claim 10 of the ’555 patent similarly provide an objective reference point: the high-quality stream must be “encoded at a bit rate of no less than 600 kbps,” and a prospective implementer can concretely evaluate from there whether two streams of differing lower quality are within the patent claims by comparing bitrates.

The Federal Circuit’s decision in *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1575 (Fed. Cir. 1986) is also informative. There the claim language involved a leg of a therapeutic chair “so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof.” 806 F.2d at 1568. The Federal Circuit held that the phrase was not indefinite even though different cars have different spacing between the doorframe and the seat, noting that the patent law “does not require that all possible lengths corresponding to the spaces in hundreds of different automobiles be listed in the patent, let alone that they be listed in the claims.” *Id.* at 1576. The claim language was “as accurate as the subject matter permits.” *Id.*

So also here. The law does not require all possible bitrates having a lower, higher, and still higher relationship be recited numerically in the claims. As long as those skilled in the art can determine whether three different streams fall within the claims with reasonable certainty, section 112, paragraph 2, is satisfied. *See Nautilus*, 572 U.S. at 901.

Respondents also argue that the quality claim terms are indefinite “because improvements in streaming technology have changed views on what ‘low’, ‘medium’ or ‘high’ quality means since the effective filing date of the patents.” Resps. Br. at 45. This argument is akin to the argument in *Orthokinetics* that cars might come in “varying sizes,” rendering indefinite a claimed dimension dependent on “the space between the doorframe of an automobile and one of the seats thereof.” See 806 F.2d at 1575-76. But the potential for variation in *Orthokinetics* was “of no moment” because the dimensions of a car “could be easily obtained” by a person of skill in the art, and the artisan could use those dimensions to undertake the comparison required by the claims. *Id.* So also here. Improvements in technology may increase bitrates of video streams in the future, but respondents do not dispute that, at that future date, an ordinary artisan will still be able to readily ascertain the bitrate of three given streams and make comparisons to determine which bitrate is higher than the other two, which bitrate is lower than the other two, and which bitrate falls between the other two.

In sum, respondents have not shown by clear and convincing evidence that the asserted claims of the ’554 patent and ’555 patent are indefinite due to their use of the terms “low quality,” “medium quality,” and “high quality.”

b) Construction

The Staff argues that a person of ordinary skill in the art would understand boundaries of the quality terms with reasonable certainty so long as those terms are construed to include numerical ranges. See Staff Br. at 50-52. Thus, the Staff proposes constructions that recite particular bitrate ranges for each of the low-quality, medium-quality, and high-quality streams. See *id.*

The Staff's argument is erroneous. The numerical limits proposed by the Staff come from the following passage of the CIP specification:

For example, the low quality stream 204 may be encoded and compressed to a bit rate of 100 kilobits per second (kbps), the medium quality stream 206 may be encoded and compressed to a bit rate of 200 kbps, and the high quality stream 208 may be encoded and compressed to 600 kbps.

'554 patent at 7:31-36 (emphasis added). The numbers in this passage are specifically identified as an "example," and the CIP specification goes on to state that the invention encompasses streams "having varying degrees of quality and bandwidth" and describes multiple encoding schemes that can be used with the invention, including "DivX®, Windows Media Video®, Quicktime Sorenson 3®, On2, OGG Vorbis. MP3, or Quicktime 6.5/MPEG-4® encoded content." '554 patent at 7:20-24. It would be error, therefore, to read into the claims the numbers of one particular example in the specification where the disclosed invention is plainly broader than that example. *See Phillips*, 415 F.3d at 1323 ("although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments").

The Staff further argues that "*any streaming system with three or more different streams encoded at different bitrates* would necessarily infringe the asserted patent claim limitations reciting low, medium, and high quality streams." Staff Br. at 51-52 (emphasis in original) (citing Jeffay Tr. 646). "But a claim is not indefinite just because it is broad." *Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.*, 30 F.4th 1339, 1347 (Fed. Cir. 2022). "[T]he canon that claims should be construed to preserve their validity, if possible, applies only if the scope of the claims is ambiguous." *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 914 (Fed. Cir. 2004). As discussed above, the scope of the claims here is reasonably certain, not ambiguous, and the canon

does not apply. “[R]eading into a claim a limitation that it does not contain” in this circumstance would be error. *See Texas Instruments Inc. v. U.S. Int’l Trade Comm’n*, 871 F.2d 1054, 1065 (Fed. Cir. 1989) (“It was not permissible for the ALJ, in order to preserve the validity of the claims, to rewrite them to add a limitation . . .”).

c) Conclusion

The terms “low quality stream,” “medium quality stream,” and “high quality stream” do not render the relevant claims indefinite. The three terms will be construed to have their plain and ordinary meaning.

4. “factor” terms (’564 patent, claim 1; ’156 patent, claim 1)

Below is a chart showing the parties’ proposed claim constructions.

Term	DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
<p>“a factor indicative of the current ability to sustain the streaming [of the video ... wherein the set of one or more factors relate to the performance of the network]”</p> <p>'564 patent, claim 1</p>	<p>Plain and ordinary meaning (<i>e.g.</i>, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video)</p>	<p>Indefinite</p>	<p>Plain and ordinary meaning (<i>e.g.</i>, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video)</p>
<p>“a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video”</p> <p>'156 patent, claim 1</p>	<p>Plain and ordinary meaning (<i>e.g.</i>, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video)</p>	<p>Indefinite</p>	<p>Plain and ordinary meaning (<i>e.g.</i>, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video)</p>

See JX-0016 at 7-8.

The claim term “a factor indicative of the current ability to sustain the streaming” appears in claim 1 of the '564 patent. JX-0001 ('564 patent) at claim 1. The claim term “a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video” appears in claim 1 of the '156 patent. JX-0004 ('156 patent) at claim 1.

The dispute between the parties is whether the plain and ordinary meaning of the words should be applied or whether the claim terms are indefinite. Respondents argue that the claims reciting the “factor” terms are indefinite for three reasons: (1) a person of skill would not have

understood the scope of “sustain the streaming,” which respondents contend is distinct from the separately recited concept of “continuous playback”; (2) the ’564 patent claims are further ambiguous because they refer to the “current ability” to sustain the streaming and the timeframe for “current” cannot be ascertained; and (3) the scopes of both “repeatedly generating a factor” and “successive determinations” are unbounded and unclear. *See* Resps. Br. at 36-39.

DISH and the Staff essentially argue the ordinary meaning of the phrases should apply.

Claim 1 of the ’564 patent recites gives context to the parties’ dispute. It recites in part:

1. An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station **comprising:**

a media player . . . wherein the media player streams the video by:

* * *

automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including **repeatedly generating a factor indicative of the current ability to sustain the streaming of the video** using the files from different ones of the copies, **wherein the set of one or more factors relate to the performance of the network;**

making the successive determinations to shift the playback quality **based on the factor to achieve continuous playback of the video** using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; . . .

JX-0001 (’564 patent) at claim 1 (emphasis added). Claim 1 of the ’156 patent is similar, and respondents make no separate arguments regarding the factor terms in that claim. *See* JX-0004 (’156 patent) at claim 1 (“repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video; adapting the successive determinations to shift the playback quality based on the factor to achieve

continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time”).

I organize my analysis around respondents’ arguments as they bear the burden to show by clear and convincing evidence that the patent claims are invalid for being indefinite.

a) “sustain the streaming of the video”

Respondents contend a person of ordinary skill in the art would not have understood the scope of the phrase “sustain the streaming of the video.” Resps. Br. at 36.¹¹ But respondents’ own brief and testimony from respondents’ own expert both counter that argument. First, respondents admit that the concept of streaming was understood in the art at the time of the invention. Resps. Br. at 37 (citing JX-0001 (’564 patent) at 1:31-33 (“‘Streaming media’ refers to technology that delivers content at a rate sufficient for presenting the media to a user in real time as the data is received.”)). As to the word “sustain,” respondents cite testimony from their expert Dr. Richardson that “streaming could be sustained, for example: (a) so long as the TCP connection between the server and client is not broken, (b) when there is a certain level of bandwidth utilization, (c) based on the latency between request and response, or (d) when the network is able to transfer at a certain bitrate.” Resps. Br. at 38 (citing RX-0001C (Richardson DWS) Q/A 134-35). Dr. Richardson’s testimony supports a conclusion that an ordinary artisan at the time of the invention would have known the conditions that could interrupt a sustained video stream, which undercuts a conclusion that the disputed language is indefinite.

Respondents next argue “the streaming of data in a packet-based network, like the internet, is inherently inconsistent and unpredictable,” and therefore it would be unclear to an ordinary

¹¹ Respondents concede “at least in concept, a person of skill may have understood what it means to ‘achieve continuous playback’ (uninterrupted viewing of the content).” Resps. Br. at 37-38.

artisan “*how* a factor could be indicative of an ability to ‘sustain the streaming of a video.’” Resps. Br. at 38 (emphasis added). But criticism of a patent’s explanation of “how” an invention works sounds more properly in the enablement provision of section 112, not the definiteness requirement of that section. As Judge Giles Rich, a primary author of the 1952 Patent Act explained, “subject matter as to which the specification is not ‘enabling’ should be rejected under the first paragraph of § 112 rather than the second,” and an accurate evaluation of patentability requires a clear understanding of “exactly which of the several requirements of § 112 are thought not to have been met.” *In re Borkowski*, 422 F.2d 904, 909 (C.C.P.A. 1970); *see also Kinetic Concepts, Inc. v. Blue Sky Med. Grp., Inc.*, 554 F.3d 1010, 1015 (Fed. Cir. 2009) (rejecting an argument that the claim phrase “a screen adapted to prevent overgrowth of wound tissue” was indefinite because an artisan would not know “how a ‘screen’ could prevent it”); *All Dental Prodx, LLC v. Advantage Dental Prod., Inc.*, 309 F.3d 774, 779 (Fed. Cir. 2002) (“The primary purpose of the definiteness requirement is to ensure that the claims are written in such a way that they give notice to the public of the extent of the legal protection afforded by the patent . . .”). Respondents’ contention that the ’564 and ’156 patents supposedly fail to explain “how” the performance factor works is inapt to the definiteness requirement of section 112.

In any event, a person of skill in the art at the time of the invention *would* know how to generate a factor indicative of an ability to sustain the streaming of a video. In column 12 of the ’564 patent, the specification describes an embodiment in which a controller calculates a performance ratio across a number of samples, taking into the playback length of the streamlets involved. *See* JX-0001 (’564 patent) at 12:15-27. The specification also contemplates variations that “better judge the central tendency of the performance ratio” using “a geometric mean, or

alternatively an equivalent averaging algorithm.” *Id.* at 12:28-39. These calculations culminate in a performance factor. *Id.*

The specification goes on to explain how the invention uses the performance factor to sustain streaming in response to changes in network conditions. The current factor is compared to a threshold value to determine whether the quality of the stream can be shifted up, taking into account a “safety margin” of ready-to-present streamlets that will mitigate against unexpected “network disruptions.” *Id.* at 12:40-64. Depending on conditions, the invention may also compare the current factor to another threshold value to determine whether the quality of the stream should be shifted down. *Id.* at 12:65-13:10.

Respondents also implicitly concede that the performance factor teachings in the patent specification would have been understood by those skilled in the art at the time of the invention, and that a person of skill in the art would have understood how to extend these teachings to make “similar calculations.” Resps. Br. at 39 (“*Unless* the claims are limited to the column 12 example (*and similar calculations*), a [person of ordinary skill in the art] would have no idea as to the boundaries of these claims.” (emphasis added)). That statement further undermines a conclusion that the claims are indefinite.

To the extent that Respondents argue a person of ordinary skill in the art would not understand what it means to “achieve continuous playback” and what it means to “sustain the streaming,” any such confusion is not present in the plain language of the claims. The claims state the invention “repeatedly generat[es] a factor indicative of the current ability to sustain the streaming of the video,” and the factor “relate[s] to the performance of the network.” The claims also state the invention makes “successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video.” Thus, “the current ability to sustain the

streaming of the video” relates to an analysis of network conditions, while the phrase “continuous playback of the video” is the goal sought through the “determinations to shift” playback quality.

In sum, the fact that there may be a variety of complex conditions that must align for streaming to be sustained does not mean a person of skill in the art would not know whether a factor reflects an evaluation of those conditions. *See Personalized Media Commc’ns, LLC v. Int’l Trade Comm’n*, 161 F.3d 696, 706 (Fed. Cir. 1998) (“The invention’s operability may say nothing about a skilled artisan’s understanding of the bounds of the claim.”); *see also Invitrogen Corp. v. Biocrest Mfg., L.P.*, 424 F.3d 1374, 1384 (Fed. Cir. 2005) (arguments about “the difficulty of avoiding infringement” are not relevant to the indefiniteness inquiry).

Respondents have not demonstrated that the phrase “sustain the streaming” is indefinite. The ordinary meaning of the words in the claim will apply.

b) “current ability”

Respondents next argue that because the patent specification describes averaging several “past” samples to calculate a performance factor, an ordinary artisan “would not know how to determine the ‘current ability to sustain streaming,’” rendering the claims with that phrase indefinite. Resps. Br. at 40-41 (emphasis in original). Respondents’ argument fails on multiple levels. First, as noted above, criticizing disclosure of “how” an invention works is not clear and convincing evidence of indefiniteness. *See In re Borkowski*, 422 F.2d at 909; *Kinetic Concepts, Inc. v. Blue Sky Med. Grp., Inc.*, 554 F.3d at 1015 (rejecting an argument that the claim phrase “a screen adapted to prevent overgrowth of wound tissue” was indefinite because an artisan would not know “how a ‘screen’ could prevent it”).

Next, to the extent respondents argue that the continuation specification does not help to inform an ordinary artisan about the scope of the claims, respondents ignore the full scope of that

[REDACTED]

disclosure. Column 12 of the '564 patent specification and corresponding passages in the '156 patent plainly describe an embodiment that “monitors [] the receive time of the requested streamlet.” JX-0001 ('564 patent) at 12:8-10. Such a measurement reflects a current condition, and that current condition is used in the calculation labeled $\phi_{current}$. *Id.* at 12:28-49. Although the continuation specification describes one embodiment of the invention that “*may* calculate a geometric mean, or alternatively an equivalent averaging algorithm” “across a window of samples,” that disclosure does not limit the claims. *See* JX-0001 ('564 patent) at 12:15-39 (emphasis added); *Phillips*, 415 F.3d at 1323 (“although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments”). And even in the disclosed embodiments, samples within an averaged “window” can occur within seconds of each other. *See, e.g.*, JX-0001 ('564 patent) at 6:65-67. An ordinary artisan would understand calculations derived from samples in such a window to be “indicative of the current ability to sustain the streaming of the video.” *See id.* at claim 1; CX-0008C (Jeffay RWS) at Q/A 390-91.

Respondents have not demonstrated that the phrase “current ability” is indefinite. The ordinary meaning of the words in the claim will apply.

c) “repeatedly generating a factor” and “successive determinations” ('564 patent, claim 1; '156 patent, claim 1)

Below is a chart showing the parties' proposed claim constructions.

Term	DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
"repeatedly generating a factor" '564 patent, claim 1; '156 patent, claim 1	"generating a factor more than once"	Indefinite	"generating a factor more than once"
"successive determinations" '564 patent, claim 1; '156 patent, claim 1	Plain and ordinary meaning (e.g., more than one determination)	Indefinite	"more than one determination"

See JX-0016 at 7-8.

The claim term "repeatedly generating a factor" appears in claim 1 of the '564 patent and claim 1 of the '156 patent. JX-0001 ('564 patent) at claim 1; JX-0004 ('156 patent) at claim 1. The claim term "successive determinations" appears in claim 1 of the '564 patent and claim 1 of the '156 patent. JX-0001 ('564 patent) at claim 1; JX-0004 ('156 patent) at claim 1.

Respondents argue these terms are indefinite. DISH and the Staff argue that "repeatedly generating a factor" should be construed to mean "generating a factor more than once." Regarding "successive determinations," DISH argues the ordinary meaning of the words should be applied, while the Staff contends that this term should be construed to mean "more than one determination."

For the reasons discussed below, (1) "repeatedly generating a factor" will be construed to mean "generating a factor more than once," and (2) "successive determinations" will be construed to have its plain and ordinary meaning, an example of which is "multiple determinations."

Respondents argue that it would have been unclear to one of ordinary skill in the art how many times a factor must be generated before it can be considered to be "repeated." See Resps.

Br. at 41-42. However, it is well understood in the art that an action performed repeatedly requires at least two occurrences. *See* CX-0008C (Jeffay RWS) Q/A 392. The teachings in the continuation specification are consistent with this understanding. The '564 patent describes decisional logic for generating a performance factor more than once. *See* JX-0001 ('564 patent) at 13:5-8 ("If the end of the stream has not been reached 714, the agent controller module 402 begins to request and receive 704 lower quality streamlets and the method 618 starts again."). This is illustrated in Figure 7 of the '564 patent, reproduced below:

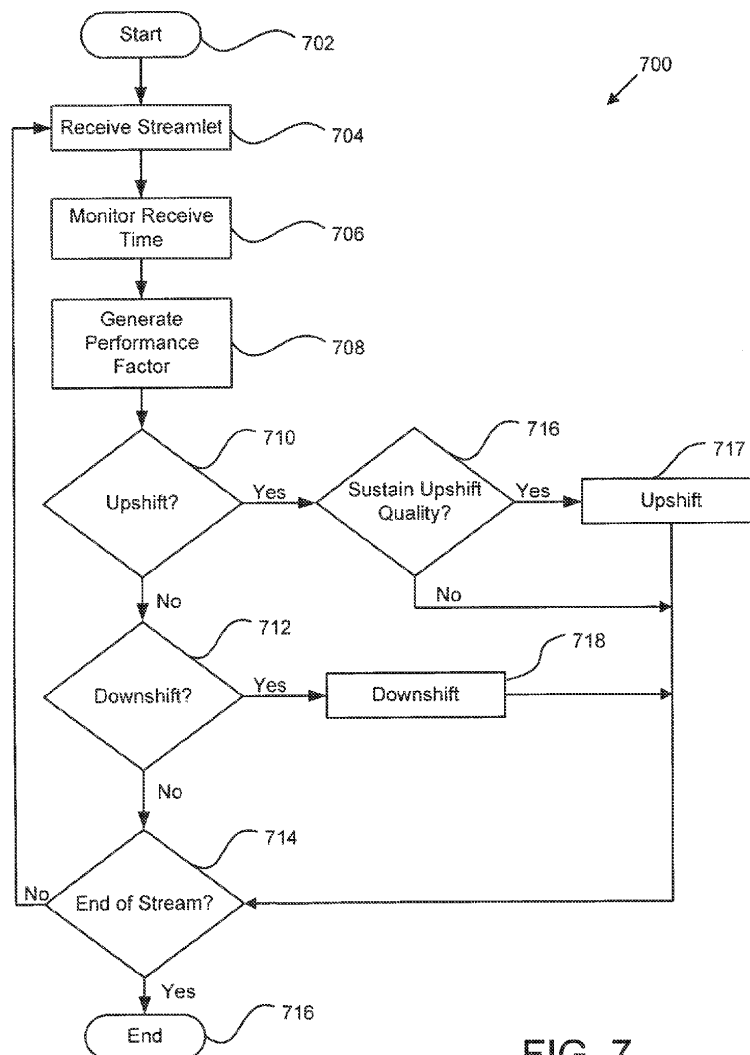


FIG. 7

JX-0001 ('564 patent) at Fig. 7. As shown in Figure 7, step 708 (Generate Performance Factor) is performed each time the logic loop reaches step 714 and it is determined that the end of the stream has not been reached. These teachings confirm that an ordinary artisan would understand what it means to repeatedly generate a factor.

The prosecution history for the parent '772 patent further informs an ordinary artisan that the inventors used the term “repeatedly” in its normal sense. In a non-final rejection under 35 U.S.C. § 112, ¶ 2, the examiner noted that that “the phrase ‘regularly generating a set of one or more factors’ is vague and unclear because it is not known how often ‘regularly’ encompasses,” and that the phrase “will be taken to mean generating a set of one or more factors at any time set.” JX-0030 ('772 patent FH) at 3111-12. In response, the applicant amended the subject claim to instead recite “repeatedly generating a set of one or more factors.” The applicant explained that the claim also recites “making the successive determinations to shift the playback quality based on at least one of the set of factors,” and argued that “[b]ecause more than one determination is made and the determinations are based on the set of factors, the set of one or more factors are generated more than once.” *Id.* at 3112. The applicant then provided an explicit definition: “[a]s such, the phrase ‘repeatedly generating’ means that the set of factors are generated more than once, not just ‘at any time set,’ as alleged by the Examiner.” *Id.* The applicant, therefore, provided clear notice that “repeatedly generating” means that the set of factors are “generated more than once.”

Regarding “successive determinations,” Respondents argue that “successive” and “repeatedly” are different terms, and are presumed to have different meanings. *See* Resps. Br. at 42-43 (citing *Ethicon Endo-Surgery, Inc. v. U.S. Surgical Corp.*, 93 F.3d 1572, 1579 (Fed. Cir. 1996)). While such a presumption may apply, that does not mean a person of skill in the art would not know how to interpret them. “Successive” refers to an order, implying one event occurs after

another, and does not necessarily imply that the two events are identical. On the other hand, stating that an action is performed “repeatedly” does not necessarily identify which instance occurred after another, but it does imply that the same action has occurred multiple times. Neither term excludes the possibility of intervening events. Respondents cite no evidence—intrinsic or extrinsic—that contradicts these ordinary understandings.

Respondents question whether “a determination needs to be made for every generation of a factor for them to be considered ‘successive.’” Resps. Br. at 43. But the claims have no such requirement, and respondents point to no disclaimer in the continuation specification that would limit the invention in that way. *See Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009) (applying “a heavy presumption that claim terms carry their full ordinary and customary meaning, unless it can show the patentee expressly relinquished claim scope”).

Respondents have not demonstrated that the phrases “repeatedly generating a factor” and “successive determinations” are indefinite.

As for the differences between the constructions advanced by DISH and by the Staff, neither party has explained how those differences are material to the investigation. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1570 (Fed. Cir. 1997) (neither the Federal Circuit nor the Supreme Court have held “that the trial judge must conduct such a rote exercise” as construing claims “whether or not there is an issue in material dispute as to the meaning”). To the extent a construction is necessary, I have determined to construe: (1) “repeatedly generating a factor” to mean “generating a factor more than once,” and (2) “successive determinations” to have its plain and ordinary meaning.

5. “device” terms: “An end user station,” “the content player device,” and “client module”

a) “An end user station” and “the content player device” (’554 patent, claim 16)

Below is a chart showing the parties’ proposed claim constructions.

Term	DISH’s Proposed Construction	Respondents’ Proposed Construction	The Staff’s Proposed Construction
<p>“An end user station”</p> <p>’554 patent, claim 16</p>	<p>Plain and ordinary meaning (<i>e.g.</i>, network-connected client device that is configured to play content)</p>	<p>Indefinite for lack of antecedent basis and to the extent it is equated to “content player device” in the identified claims</p>	<p>Plain and ordinary meaning (<i>e.g.</i>, a network-connected electronic system configured to present content to a user);</p> <p>identified claims are indefinite</p>
<p>“the content player device”</p> <p>’554 patent, claim 16</p>	<p>Plain and ordinary meaning (<i>e.g.</i>, network-connected client device that is configured to play content)</p>	<p>Indefinite for lack of antecedent basis and to the extent it is equated to “end user station(s)” in the identified claims</p>	<p>Plain and ordinary meaning (<i>e.g.</i>, a device that plays content);</p> <p>identified claims are indefinite</p>

See JX-0016 at 8-9.

The claim terms “[a]n end user station” and “the content player device” appear in the preamble of independent claim 16 of the ’554 patent, which recites:

An end user station to stream a live event video over a network from a server for playback of the video, **the content player device** comprising:

JX-0002 (’554 patent) at claim 16 (emphasis added). Respondents assert claim 16 is indefinite because the phrase “the content player device” lacks antecedent basis. DISH and the Staff propose

the terms be given their plain meaning, though the Staff concludes that this renders the claim indefinite.

(1) Whether the Preamble Is Limiting

Respondents argue that “the preamble of claim 16 of the ’554 patent is limiting because it serves as the antecedent basis for a limitation in the body of the claims.” Resps. Br. at 51 n.13. The Staff agrees that the preamble is limiting because “the patentee decided to use the preamble to help define the invention by using the preamble to provide antecedent basis for three terms used in the body of the claim.” Staff Br. at 72.

In general, “the preamble does not limit the claims.” *Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002). Nonetheless, the preamble may be construed as limiting “if it recites essential structure or steps, or if it is ‘necessary to give life, meaning, and vitality’ to the claim.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (quoting *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)). “If the body of the claim ‘describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention,’ the preamble is generally not limiting unless there is ‘clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art.’” *Intirtool, Ltd. v. Texar Corp.*, 369 F.3d 1289, 1295 (Fed. Cir. 2004) (citations omitted) (quoting *Catalina Mktg.*, 289 F.3d at 808, 809).

Claim 16 recites:

An end user station to stream a live event video over a network from a server for playback of the video, the content player device comprising:

a processor;

a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

[REDACTED]

establish one or more network connections between the end user station and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

wherein the live event video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream, each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the live event video;

wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and

wherein the first streamlets of each of the low quality stream, the medium quality stream and the high quality stream each has an equal playback duration and each of the first streamlets encodes the same portion of the live event video at a different one of the different bitrates;

select a specific one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams;

place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;

receive the requested first streamlet from the server via the one or more network connections; and

provide the received first streamlet for playback of the live event video.

JX-0002 ('554 patent) at claim 16. As can be seen, the preamble states that the purpose of the invention is “to stream a live event video over a network from a server for playback of the video.”

Id. The claim body recites a structurally complete invention including all of the elements necessary for achieving that purpose. The body recites a processor structure, a memory structure, and instructions stored in that memory that enable the invention’s purpose of streaming a live event video. “[T]he claim drafters did not rely on the preamble language to define or refine the scope of the asserted claims.” *See Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1358-59 (Fed. Cir.

2010) (finding the preamble non-limiting where the preamble recited the word “tissue” as part of a description of the purpose of the invention but the preamble did not provide any context essential to understanding the meaning of “the tissue” in the body of the claim).

Indeed, when the preamble “is reasonably susceptible to being construed to be merely duplicative of the limitations in the body of the claim,” it is “not construe[d] [] to be a separate limitation.” *Symantec Corp. v. Computer Assocs. Int’l, Inc.*, 522 F.3d 1279, 1289 (Fed. Cir. 2008). In the case at hand, each of the phrases between “[a]n end user station” and “the content player device” duplicates a limitation found in the body of the claim, suggesting that the patentee used the preamble to state the intended use of the invention, rather than to limit the claim’s scope.

For example, while the preamble states the invention’s purpose is streaming content “over a network from a server,” the body of the claim correspondingly specifies content is transferred over “one or more network connections between the end user station and the server.” The preamble further describes the invention’s purpose is “to stream a live event video . . . for playback of the video,” and the claim’s body likewise recites that “the live event video is encoded” into “streamlets corresponding to a portion of the live event video” and the processor “provide[s] the received first streamlet for playback of the live event video.” The duplication between the preamble and the claim body at issue here is a strong indication that there should be no departure from “the general rule” that a preamble is not limiting. *See Symantec*, 522 F.3d at 1289. I determine the preamble of claim 16 of the ’554 patent is not limiting.

(2) Interchangeability of “content player device” and “end user station”

Respondents focus on the terms “content player device” and “end user station” to argue the claim is indefinite. Resps. Br. at 49-50. They contend the claims at issue “use the terms ‘end user

station’ and ‘content player device’ interchangeably, while “the specification provides different meanings for each of those terms.” *Id.* Respondents assert that this purported conflict means an ordinary artisan “would not understand with reasonable certainty the scope of the terms.” *Id.*

As an initial matter, the term “content player device” only appears in the preamble of claim 16, while the term “end user station” appears both in the preamble and in the body of the claim. Because I have determined that the preamble is not limiting, the term “content player device” introduces no conflict in meaning with the term “end user station.” Respondents’ argument is rejected on at least that basis.

But there are other reasons for rejecting respondents’ argument. Although respondents are correct that the general assumption is that different terms have different meanings, “the same generally is not true for terms in the preamble.” *Symantec*, 522 F.3d at 1289. A tribunal should “assume[] that the preamble language is duplicative of the language found in the body of the claims or merely provides context for the claims, absent any indication to the contrary in the claims, the specification or the prosecution history.” *Id.* Moreover, it is error to parse claim language “without regard to the surrounding language in the claims and the written description of the invention.” *Pavo Sols. LLC v. Kingston Tech. Co., Inc.*, 711 F. App’x 1020, 1028 (Fed. Cir. 2017) (“[T]he [PTAB] . . . created a distinction that does not exist in the specification, solely because the words ‘on’ and ‘formed on’ are literally different.”).

Here, there is no indication in the claims that the “content player device” in the preamble means anything other than the previously-recited “end user station.” The preamble recites no separate purpose for the “content player device”; it is the same as for the invention as a whole: “to stream a live event video over a network from a server for playback of the video.” The body of the claim leads to no different conclusion. In the claim body, “end user station” appears in the

phrases “establish one or more network connections between the end user station and the server,” and “select a specific . . . stream based upon a determination by the end user station.” Neither of these phrases distinguishes the “end user station” from the “content player device.” Thus, the claim as a whole indicates that the “content player device” in the preamble means the “end user station.” *See Bid for Position, LLC v. AOL, LLC*, 601 F.3d 1311, 1317 (Fed. Cir. 2010) (“The claim language uses the terms ‘bid’ and ‘value of the bid’ interchangeably, such that the two cannot be read to have separate meanings.”).

The specification provides further support for the conclusion that the “content player device” in the preamble is the “end user station.” The specification recites, “The end user station 104 may comprise a personal computer (PC), an entertainment system configured to communicate over a network, or a portable electronic device configured to present content.” JX-0002 (’554 patent) at 6:44-47. Hence, one of the three listed examples of the end user station is “a portable electronic device configured to present content.” In other words, one embodiment of an “end user station” is a content-playing device. The presumption that different terms have different meanings has been overcome here, where “the evidence indicates that the patentee used the two terms interchangeably.” *Baran v. Med. Device Techs., Inc.*, 616 F.3d 1309, 1316 (Fed. Cir. 2010); *see also Tehrani v. Hamilton Med., Inc.*, 331 F.3d 1355, 1361 (Fed. Cir. 2003) (“[T]he intrinsic evidence indicates that the patentee meant for those two terms to be interchangeable and to carry the same meaning within the claims.”).

Moreover, the record contains evidence from both opposing experts that the term “content player device,” as it is recited in the preamble of claim 16, would be understood by one of ordinary skill in the art to be the same as the “end user station.” For example, DISH’s expert Dr. Jeffay opined that an ordinary artisan would understand the invention “is interchangeably described and


instantiated in the claims, specifications, and prosecution histories” as a “content player device” and as an “end user station.” CX-0008C (Jeffay RWS) at Q/A 385. Although Respondents’ expert Dr. Richardson gave an opinion that the claim term was indefinite because it could be interpreted multiple ways, he nevertheless testified that a person of ordinary skill would understand that one “feasible” interpretation of the terms is that “content player device” and “end user station” are interchangeable terms. RX-0001C (Richardson DWS) at Q/A 139. In their briefing, respondents also state that “the terms ‘end user station’ and ‘content player device’ are used interchangeably within the same claim.” Resps. Br. at 48; *see also id.* at 49 (“’554 Patent’s Claims Indefinite For Using ‘End User Station’ And ‘Content Player Device’ Interchangeably And Without Antecedent Basis”), 49 (the relevant claims “use the terms ‘end user station’ and ‘content player device’ interchangeably”), 51 (“[T]he claims’ interchangeable use of these two terms makes it such that the meaning and relationship of the terms would not be reasonably understood by a [person of ordinary skill in the art] considering the intrinsic evidence . . .”).

Accordingly, I have determined that the term “content player device” does not limit the scope of the claim, is interchangeable with “end user station,”¹² and requires no construction. Furthermore, respondents have not presented clear and convincing evidence that claim 16 of the ’554 patent is indefinite.

b) “the client module” (’555 patent, claim 10)

Below is a chart showing the parties’ proposed claim constructions.

¹² A different way to state the conclusion herein is that the first words of the preamble—“[a]n end user station”—provide antecedent basis for the later “content player device” because both terms refer to the same object. *See Fisher-Price, Inc. v. Graco Children’s Prod., Inc.*, 154 F. App’x 903, 909 (Fed. Cir. 2005) (claim term “upper seating surface” was “by implication the antecedent basis for ‘seating area’”).



Term	DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
"client module" '555 patent, claim 10	Plain and ordinary meaning (<i>e.g.</i> , subcomponent of the content player device / end user station)	Indefinite for lack of antecedent basis in the identified claims	"the part of the end user station that interacts with one or more servers and plays content"

See JX-0016 at 9.

The claim term "client module" appears in independent claim 10 of the '555 patent. JX-0003 ('555 patent) at claim 10. Respondents argue claim 10 is indefinite because the term "the client module" lacks antecedent basis. DISH and the Staff do not view the claim as indefinite but disagree as to its proper construction.

Claim 10 is reproduced in part below to give context to the dispute. As can be seen, the term "client module" is first introduced by the definite article "the" rather than the indefinite article "a":

[10pre] A content player device to stream a video over a network from a server for playback of the video, the content player device comprising:

[10a] a processor;

[10b] a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

[10c] establish one or more network connections between **the client module** and the server, . . .

* * *

[10g] select a specific one of the streams based upon a determination by **the client module** to select a higher or lower bitrate version of the streams . . .

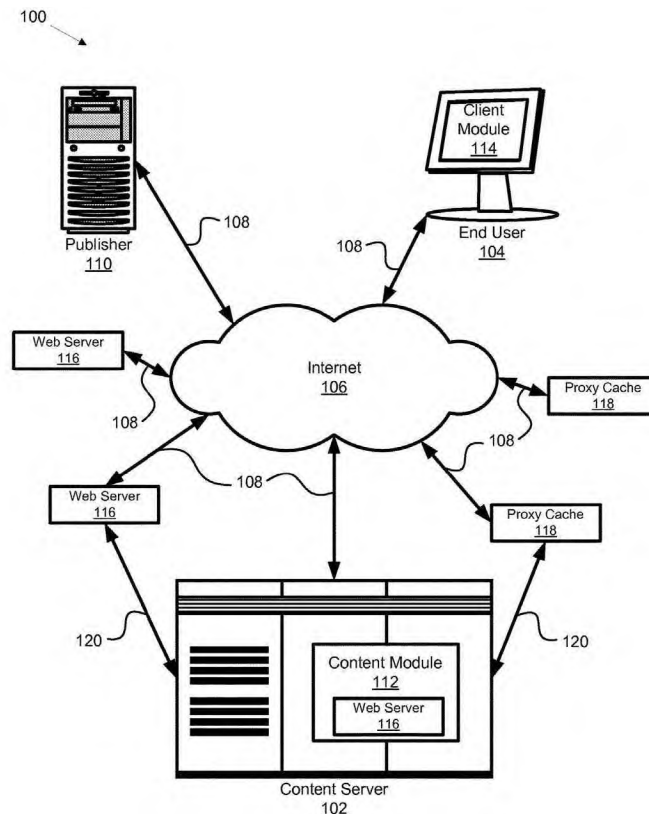
JX-0003 ('555 patent) at claim 10 (emphasis added).

The requirement of antecedent basis is a rule of patent drafting, administered during patent examination. *Energizer Holdings, Inc. v. Int'l Trade Comm'n*, 435 F.3d 1366, 1370 (Fed. Cir. 2006). “Obviously, however, the failure to provide explicit antecedent basis for terms does not always render a claim indefinite.” MPEP § 2173.05(e) (9th ed. 2019). “If the scope of a claim would be reasonably ascertainable by those skilled in the art” when read in light of the rest of the specification, a technical deficiency in antecedent basis does not doom the claim. *See Energizer Holdings*, 435 F.3d at 1370.

The language of claim 10 “provide[s] substantial guidance as to the meaning” of the claim term in question. *Phillips*, 415 F.3d at 1314. The term “client module” appears in the claim’s description of operations performed by a processor in the claimed content player device. The claim states that the processor establishes a network connection between the client module and the server. *See* '555 patent at claim 10. This accords with the description of the client module given in the CIP specification, which states that in one embodiment “the client module 114 may request

and receive content from any of the plurality of web servers 116.” ’555 patent at 6:60-67. In particular, claim 10 recites that the client module interacts with the server via a network connection, and makes a determination as to the selection of a higher or lower bitrate version of the streams. *See* ’555 patent at claim 10. This accords with the description of the client module given in the CIP specification, which states that in one embodiment “the client module 114 may request and receive content from any of the plurality of web servers 116.” ’555 patent at 6:60-67.

In addition, the client module 114 is described as a part of end user station 104 in Figure 1 of the CIP specification:



JX-0003 (’555 patent) at Fig. 1. The end user station 104, in turn, “may comprise a personal computer (PC), an entertainment system configured to communicate over a network, or a portable electronic device configured to present content.” *Id.* at 6:44-47. Because an end user station may

[REDACTED]

be a content player device, as discussed above in section VII.B.5.a)(2), the specification informs an ordinary artisan that a client module may be part of a content player device, consistent with the language of claim 10.

Extrinsic evidence confirms one of ordinary skill in the art, upon reading claim 10 in view of the CIP specification, would understand what “the client module” is. As Dr. Jeffay testified,

[T]he patents describe an “apparatus” for streaming content that is identified in the claims by the interchangeable phrases “end user station(s),” “end user device,” and “content player device,” and within that apparatus may be “a logic unit containing a plurality of modules,” such as the claimed “client module” and “media player.” For example, the ’564 Patent (JX-0001) at 2:60-62 explains that “[t]he apparatus for adaptive-rate content streaming is provided with a logic unit containing a plurality of modules configured to functionally execute the necessary steps.” . . .

. . . [T]he “logic unit containing a plurality of modules” provided with the apparatus is described and instantiated in the claims, specification, and prosecution histories as a “client module,” which is part of the client device that interacts with the server. . . .

CX-0008 (Jeffay RWS) at Q/A 385. Dr. Richardson likewise testified that claim 10 “disclose[s] a ‘content player device’ with software that causes the ‘content player device’ to perform a series of steps for streaming video over a network.” RX-0001C (Richardson DWS) at Q/A 139. Dr. Richardson explained that claim 10 states certain of those steps are “performed by ‘the client module.’” Dr. Richardson’s testimony is consistent with an understanding that “the” client module in claim 10 is part of the “content player device” and that it connects to as server over a network.

Thus, the intrinsic and extrinsic evidence confirms that, despite a technical lack of antecedent basis, the term “the client module” informs those of ordinary skill in the art about the scope of the invention “with reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). I determine that respondents have not shown by clear and convincing evidence that claim 10 is invalid because it is indefinite.

Turning to the interpretation of the term “the client module,” there is no meaningful difference between the construction proposed by DISH, the construction proposed by the Staff, and the plain language of the claim. Accordingly, I will construe the claim term “the client module” according to its plain meaning.

VIII. REPRESENTATIVE PRODUCTS FOR DOMESTIC INDUSTRY (TECHNICAL PRONG)

DISH’s domestic industry evidence involves two groups of products: (1) television set-top boxes and (2) software applications for streaming television content (apps). DISH has proffered a representative product for each group. For set-top boxes, DISH contends that its Hopper 3 set-top box is representative of its Hopper, Hopper with Sling, Hopper Duo, and Wally set-top boxes (collectively, the “DISH Set-Top Boxes”). Compls. Br. at 117. For streaming apps, DISH contends that its Sling TV Application for Amazon Fire (“Sling Fire App”) is representative of the Sling TV Apps for iOS and Roku (collectively, the “Sling TV Apps”). *See id.* at 120.

Respondents dispute whether the Hopper 3 is representative of the other DISH Set-Top Boxes and whether the Sling Fire App is representative of the other two Sling TV Apps. *See* Resps. Br. at 90-94.

A. DISH Set-Top Boxes

DISH argues its investments with respect to articles protected by the asserted patents go back to at least 2016. *See* Compls. Br. at 283-84, 289-90. DISH contends that, for purposes of the technical prong of the domestic industry requirement, the Hopper 3 is representative of all other DISH Set-Top Boxes made from 2016 to the present. *See* Compls. Br. at 117. DISH relies on source code analysis and testimony by Dr. Bystrom and testimony by corporate witness Paul Marshall to show similarity between the various DISH Set-Top Boxes. *See id.* (citing CX-0006C

[REDACTED]

(Bystrom DWS) at Q/A 13-19; CX-0003C (Marshall DWS) at Q/A 24, 45). Dr. Bystrom examined source code from all DISH Set-Top Boxes models produced after December 2017 and confirmed that the various models used [REDACTED] to practice the asserted claims.

Respondents do not dispute that [REDACTED] was used on all DISH Set-Top Boxes models produced after December 2017. *See id.* at 92-93 (citing CX-0003C (Marshall DWS) at Q/A 37-40). Instead, respondents critique the adequacy of DISH's proof. Respondents argue that neither Mr. Marshall nor Dr. Bystrom reviewed any of the asserted patents, nor did either witness compare the features of the DISH Set-Top Boxes to the claims of the asserted patents. *See Resps. Br.* at 92. Respondents also note that DISH's expert Dr. Bystrom examined source code for only one of many products released before December 2017.

The evidence shows that DISH's corporate witness Mr. Marshall has personal knowledge of video streaming functionality for DISH Set-Top Boxes via his day-to-day responsibilities. *See* CX-0003C at Q/A 10-14. Mr. Marshall testified all of the DISH Set-Top Boxes at issue in this investigation have used [REDACTED] for streaming content since December 2017. *See id.* at Q/A 40. For DISH Set-Top Boxes produced after December 2017, Mr. Marshall elaborated, "the exact same [REDACTED] are used for Hopper, Hopper 2 [(Hopper with Sling)], Hopper 3, Hopper Duo, and Wally" DISH Set-Top Boxes. *See id.* at Q/A 52-53; CX-0006C (Bystrom DWS) at Q/A 17. Additionally, Dr. Bystrom confirmed source code for all DISH Set-Top Boxes produced after December 2017 have [REDACTED] [REDACTED] are compiled and included in the DISH Set-Top Boxes. *See* CX-0006C at Q/A 13-17.

With respect to DISH Set-Top Boxes produced *before* December 2017, the record is equivocal. DISH's source code expert Dr. Bystrom only reviewed a specific release of source

[REDACTED]

code for one of several pre-December 2017 DISH Set-Top Boxes. *See* CX-0006C at Q/A 18. Dr. Bystrom opined that the streaming code in all versions before December 2017 worked “in much the same way to perform adaptive bitrate streaming,” *see id.* at Q/A 19, but her conclusory analysis is insufficient to show that the post-December 2017 code operates in an identical way to the pre-December 2017 code in all respects relevant to the asserted claims. Moreover, DISH’s corporate witness Mr. Marshall admitted the source code for the pre-December 2017 player was subject to frequent revision. *See* CX-0003 at Q/A 37. Weighing the relevant record evidence together, I find DISH has not met its burden to show that the Hopper 3 is representative of DISH Set-Top Boxes produced before December 2017.¹³

In sum, DISH has adduced persuasive evidence showing that the Hopper 3 is representative of only DISH Set-Top Boxes produced after December 2017, which is when [REDACTED] was integrated and released in the other identified DISH Set-Top Boxes.

B. Sling TV Apps

DISH asserts that the Sling Fire App is representative of the Sling TV Apps for iOS and Roku. DISH cites testimony from Dr. Negus, Mr. Marshall, and Dr. Bystrom as evidence that the Sling Apps for Roku and iOS operate in substantially the same way as the Sling Fire App. *See* Compls. Br. at 120-21. Respondents contend that there are significant, material differences between the three Sling TV Apps. *See* Resps. Br. at 91.

DISH called expert Dr. Negus to present evidence regarding satisfaction of the domestic industry technical prong by the Sling TV Apps, but he provided a claim-by-claim analysis for only the Sling Fire App. *See* CX-0010C (Negus DWS) at Q/A 671, 674-75. DISH source code expert

¹³ I examine the consequence of this finding later in my analysis of the economic prong of the domestic industry requirement. *See* section XV below.

[REDACTED]

Dr. Bystrom testified as to reviewing source code for all three Sling TV Apps, but she did not offer an opinion as to the whether the source code for the Amazon Fire App was representative of that for the iOS. *See* CX-0006C (Bystrom DWS) at Q/A 20. DISH corporate witness Mr. Marshall further testified that he does not have personal knowledge of the video streaming functionality of Sling TV Apps via his day-to-day responsibilities. *See* CX-0003C (Marshall DWS) at Q/A 47.

Respondents' expert Dr. Snoeren gave testimony that each of the three Sling TV Apps "has different source code, and the player used for video playback varies among the different products." RX-0004C (Snoeren RWS) at Q/A 365. More specifically, the Sling Fire App uses the ExoPlayer media player, the Sling TV App for Roku uses the roVideoPlayer, and the Sling TV App for iOS uses the AVPlayer. *See id.* Additionally, the Sling TV Apps for the Amazon Fire and Roku use the DASH protocol and HTTP Live Streaming ("HLS"), while the Sling TV Application for iOS uses only HLS. *See id.*; CX-0010C (Negus DWS) at Q/A 671; CX-0003C (Marshall DWS) at Q/A 26.

I find that each of the three Sling TV Apps employ different media players, employ different protocols, and run on different operating systems. Given these differences, DISH has not shown that the Sling Fire App is representative of the Sling TV Apps for iOS and Roku. Because DISH did not present independent evidence that the Sling TV iOS App and the Sling TV Roku App practice any asserted patent claim, I find that DISH has not shown that articles utilizing the Sling TV iOS App and the Sling TV Roku App are "articles protected by" the asserted patents. *See* 19 U.S.C. § 1337(a)(2).

IX. THE '564 PATENT

A. Infringement

DISH contends that iFit, Peloton, and MIRROR infringe independent claim 1 and dependent claims 3, 4, and 5 of the '564 patent with accused products that implement the HLS Standard.¹⁴ *See* Compls. Br. at 47. The Staff agrees with DISH that respondents infringe claims 1 and 3-5. *See* Staff Br. at 80.

1. Claim 1

a) (1pre) An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

The parties agreed that the preamble to claim 1 is limiting. *See* JX-0016 at 1.

Respondents' accused products that implement the HLS Standard meet the preamble. *See* CX-0010C (Negus DWS) at Q/A 232-59. The relevant accused products use ExoPlayer software to retrieve live and on-demand fitness classes from content delivery network video servers over the Internet. *See id.*; RX-0004C (Snoeren RWS) at Q/A 50, 52-54; CX-0836 (RFC 8216) at Abstract, § 1. ExoPlayer software is an open-source "application-level media player for Android." RX-0004C (Snoeren RWS) at Q/A 51. Google provides the ExoPlayer software, which implements the accused HLS functionality. *See* CX-0010C (Negus DWS) at Q/A 184, 195, 207; CX-1000 (Google ExoPlayer 2.11.6); CX-0999 (Google ExoPlayer 2.13.3); CX-1001 (Google ExoPlayer 2.12.1). Respondents' expert Dr. Snoeren confirmed that each of the respondents in this investigation use HLS, and DISH's Dr. Negus confirmed that each of the respondents' accused

¹⁴ DISH does not accuse Peloton products that [REDACTED] and MIRROR products that use MPEG-DASH of infringing the '564 patent. *See* Compls. Reply Br. at 17.

[REDACTED]

products use ExoPlayer and the HLS protocol in “generally the same way.” RX-0004C (Snoeren) at Q/A 32; Negus Tr. 118.

Respondents do not contest that the accused products satisfy the preamble. *See* Resps. Br. at 53-66.

b) (1a) a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 267-80. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

c) (1b) wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 282-305.

Respondents argue that DISH has not shown that the video servers used with the various accused products store the content. *See* Resps. Br. at 62. However, DISH has adduced evidence showing that respondents’ videos are stored on their respective content delivery network servers (“CDNs”). *See* CX-0010C (Negus DWS) at Q/A 282-305. For example, a Peloton witness confirmed that “[REDACTED]

[REDACTED].” JX-0076C

(Shanahan Dep.) at 68:15-21. Another Peloton witness confirmed that [REDACTED]

[REDACTED]

[REDACTED]” JX-0077C (Santos Dep.) at 93:21-94:24.

MIRROR and iFIT witnesses also testified that their respective videos are stored on the respective

Respondents further argue that DISH has not shown that content is stored as files on a server. *See* Resps. Br. at 62-63. As discussed above, each of respondents’ accused products uses HLS “generally the same way.” *See supra* Sec. IX.A.1.a) (quoting Negus Tr. 118). Under the HLS Standard, a multimedia presentation is specified by a Uniform Resource Identifier (URI) to a Playlist. CX-0836 (RFC 8216 – HLS Standard) at 4. A Playlist may be either a Media Playlist or a Master Playlist, and it contains “URIs and descriptive tags.” *Id.* A Master Playlist “provides a set of Variant Streams,^[15] each of which describes a different version of the same content.” *Id.* at 5. In contrast, a “Media Playlist contains a list of Media Segments, which, when played back sequentially, will play the multimedia presentation.” *Id.* at 4.

¹⁵ A Variant Stream “includes a Media Playlist that specifies media encoded at a particular bit rate, in a particular format, and at a particular resolution for media containing video.” CX-0836 (RFC 8216 – HLS Standard) at 5. The Standard further recites, “Clients should switch between different Variant Streams to adapt to network conditions.” *Id.*

[REDACTED]

(Snoeren RWS) at Q/A 118, 125. Dr. Negus similarly testified that the URI and URL for each Media Segment file identify (1) the “set” of Variant Streams to which each segment belongs and (2) the location on the server where the segment is stored. CX-0010C (Negus DWS) at Q/A 282-305.

Respondents further argue that they rely upon third-party providers to provide a variety of server functions and DISH failed to demonstrate “one single server performs all the functions” necessary for respondents’ service. Resps. Br. at 62. Respondents also contend that DISH failed to address the “possibility” that different servers are involved in streaming a video to a customer. Resps. Br. at 62. As explained below, respondents’ arguments misapprehend the requirements of claim 1 and the record evidence.

First, claim 1 is directed to an “end user station” having a “media player” that is “configured” to operate in a certain environment. That environment includes a “video server” having “multiple different copies of the video encoded at different bit rates” stored “as multiple sets of files” thereon. So long as the media player streams a video from a server that has at least two different copies of the same video stored as at least two sets of files, this claim limitation is met. The claim does not require “one single server” to perform “all of the functions” for which respondents engage third-party server providers. Additionally, because the claim uses the open-ended transition term “comprising,” respondents “may not avoid infringement” by pointing to “additional elements,” like additional servers, in the systems they employ. *See Free Motion Fitness, Inc. v. Cybex Int’l, Inc.*, 423 F.3d 1343, 1353 (Fed. Cir. 2005).

The record evidence, including evidence from respondents’ own witnesses, shows that this limitation is met. It is undisputed that respondents all use third-party video servers to stream videos to the accused products. *See* Resps. Br. at 63 (“[A]ll the Accused Products communicate with

[REDACTED]

multiple servers, including at least [REDACTED]
[REDACTED] (for Accused Peloton Products), [REDACTED]
(for Accused iFIT Products), and [REDACTED] (for Accused MIRROR Products).”). The record contains evidence that each accused product interacts with at least one server having multiple files. For example, with respect to the MIRROR and iFit accused products, respondents’ expert Dr. Snoeren testified about multiple files on a single server, stating that “the segment URIs (which include the *file names* on the server) are used to request and download segments.” RX-0004 (Snoeren RWS) at Q/A 131-32 (emphasis added). With respect to the Petoton accused products, Dr. Snoeren stated that Peloton’s use of the HLS protocol “suggests” that “there are segment files” but the standard itself does not explain “how they are stored on a server.” *Id.* at Q/A 200. Dr. Snoeren’s statement implies that the Peloton system interacts with “a” single server on which multiple files are stored; he criticizes only a purported lack of detail in the standard concerning “how” those files “are stored on a server.” *Id.* (emphasis added). Dr. Snoeren made similar statements about the use of HLS with the MIRROR and iFIT accused products, questioning only “how” multiple files “are stored on a server.” *Id.* at Q/A 206, 210 (emphasis added).

Respondents relatedly argue that DISH failed to show that multiple different copies of the video are in fact stored on the video server as multiple sets of files. *See* Resps. Br. at 62-64. As discussed above, however, the evidence shows that the video servers employed by respondents in fact store the videos streamed to respondents’ accused products. An exemplary Media Playlist in the HLS Standard makes explicit reference to specific files “first.ts,” “second.ts,” and “third.ts,” which are to be streamed in sequence, as shown below:

8.1. Simple Media Playlist

```
#EXTM3U
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:3
#EXTINF:9.009,
http://media.example.com/first.ts
#EXTINF:9.009,
http://media.example.com/second.ts
#EXTINF:3.003,
http://media.example.com/third.ts
#EXT-X-ENDLIST
```

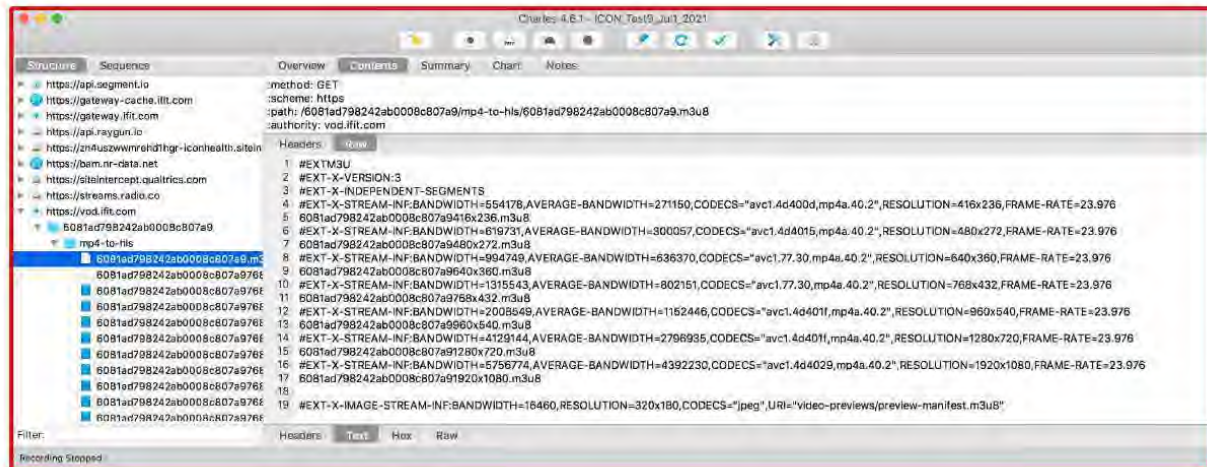
RX-0112 (RFC8216) at 50-51; RX-0004C (Snoeren RWS) at Q/A 36. Moreover, Dr. Negus's testing confirmed that the source of video segment files streamed to an iFIT product was an identifiable Amazon server at a particular IP address, as shown below:

The image displays three screenshots related to network traffic analysis:

- Top Left:** A Wireshark packet capture window showing a filter for `net 10.30.246.30`. The interface list on the left shows "Ethernet" selected.
- Top Right:** A Wireshark packet list window showing a table of captured packets. The selected packet (No. 1912) is a TLSv1.2 record from source IP 10.30.246.30 to destination IP 13.33.60.48.
- Bottom Left:** A Windows Command Prompt window showing the output of the `nslookup 13.33.60.48` command, identifying the IP as `server-13-33-60-48.ewr52.r.cloudfront.net`.
- Bottom Right:** A "13.33.60.48 address profile" window showing "IP Whois" information, identifying the IP as belonging to Amazon Technologies Inc.

CDX-0010.TEST.13 (CX-0746 (ICON_Test1_Jun30_2021.pcapng)). Dr. Negus obtained similar test results for other accused products. CDX-0010.TEST.14-17 (CX-0747-51); CDX-0010C.TEST.62-67 (CX-0707-11); CDX-0010C.TEST.103-07 (CX-0613-17).

Dr. Negus's testing further demonstrates that the server in fact stores multiple different copies of the video. As discussed above, the Master Playlist used in HLS allows for multiple Variant Streams, where the client may switch between the Variant Streams, which may be encoded at different bitrates. *See* CX-0836 (RFC 8216) 4, § 2. As shown below, Dr. Negus conducted a test using an iFit accused product to demonstrate that multiple Variant Streams stored as a set of Media Segment files could each be retrieved from storage on a server by a unique filename:



CDX-0010C.TEST.42 (CX-0754 (ICON_Test9_Jul1_2021.chls)). Dr. Negus obtained similar test results for other accused products. CDX-0010C.TEST.87 (CX-0715 (Peloton_Test9_Jul1_2021.chls)); CDX-0010C.TEST.124 (CX-0620 (Mirror_Test8_Jul2_2021.chls)). Thus, Dr. Negus's testing convincingly shows that multiple copies of a video are stored on the server as multiple sets of files.

Respondents contend that Dr. Negus's testing only shows an IP address from which content is retrieved but it does not establish that the IP address is indeed that of a server that stores content.

However, respondents' own expert Dr. Snoeren testified that Dr. Negus's testing "shows *a* server address." RX-0004C (Snoeren RWS) at Q/A 203, 208, 212 (emphasis added). The evidence recounted above more than persuasively shows that a server at the address identified by Dr. Negus stores multiple different copies of a single video as multiple sets of files.

Respondents additionally contend that Dr. Negus's testing of the respondents' unaccused iOS Apps also does not show whether the accused products meet the video server limitations. *See* Resps. Br. at 64. Respondents' argument is irrelevant. There is no dispute that Dr. Negus tested the accused products, all of which utilize the Android operating system and ExoPlayer from Google. CX-0010C (Negus DWS) at Q/A 28, 55-59, 64-65, 116-118, 123, 145, 146. Respondents' own witnesses confirmed that, for a given fitness class, the accused products of each respondent stream the same video files as their respective iOS mobile applications. CX-0010C (Negus DWS) at Q/A 296 (quoting JX-0076C (Shanahan Dep.) 134:5-135:3, 136:6-15); *id.* at Q/A 94 (quoting JX-0077C (Santos Dep.) at 85:6-86:4); *id.* at Q/A 288 (quoting JX-0080C (Brammer Dep.) 261:5-18, 262:4-8); *id.* at Q/A 69, 544. By streaming the same fitness class offered by a respondent on that respondent's accused product and that respondent's iOS application, Dr. Negus was able to obtain and inspect the HLS streaming asset files that are streamed by the accused products. Negus Tr. 138–139.

Dr. Negus did not rely on his testing to impute the operation of the iOS application executables or media players onto the accused products. *Id.* at 141. As noted above, claim 1 describes a media player that operates in a certain environment, and Dr. Negus' testing confirmed the environment in which the accused products operate. Testimony from respondents' witnesses and Dr. Negus's testing confirm that the accused products and the respective iOS applications stream the same fitness class videos from the same CDNs. *See e.g.*, CX-0010C (Negus DWS) at

[REDACTED]

Q/A 148, 152, 156; CDX-0010C.TEST.62, 71 (CX-0707 (PelotonTest1); CX-0712 (PelotonTest6)). Dr. Negus determined through his testing that the videos streamed by the accused products are encoded into multiple HLS variant streams of varying bitrates that correspond to “multiple different copies of the video encoded at different bitrates.” CX-0010C (Negus DWS) at Q/A 282-303. The testing also confirmed that each Variant Stream is comprised of the “set” of Media Segment transport stream files listed in the HLS media playlist for the Variant Stream, such that the sets across the multiple Variant Streams correspond to “multiple sets of files.” *Id.* Testing further demonstrated that the individual and unique URI for each Media Segment file of each set, which ends in a file extension of “.ts” to denote a transport stream file and identifies the “set” to which the segment belongs, is an individual file. *Id.* The URI for each Media Segment also specifies the location and address of that file on the server. *Id.* By retrieving the files from the specified location addresses using HTTP/HTTPS GET requests, the testing confirmed that the individual Media Segment files of the multiple sets are stored on the CDN video server at their specified location addresses. *Id.*

Notably, respondents’ expert Dr. Snoeren never offered an affirmative opinion that the accused products *do not* stream videos from a single server that stores multiple copies of that video in multiple files.

The record evidence thus demonstrates that respondents’ accused products, with the exception of [REDACTED],¹⁶ include a media player configured to stream a video from

¹⁶ Peloton argues that its [REDACTED] lacks this limitation. *See* Resps. Br. at 66. Peloton presented evidence that its [REDACTED] does not have “multiple sets of files” because “the video for each bitrate variant is [REDACTED] and to the extent that [REDACTED] is ever stored in a filesystem, it [REDACTED].” *Id.*; RX-0004C (Snoeren RWS) at Q/A 319-22. DISH, however, does not accuse Peloton’s [REDACTED] of infringing the ’564 patent, rendering Peloton’s argument moot.

a server that stores multiple different copies of the video encoded at different bit rates as multiple sets of files. *See* CX-0010C (Negus DWS) at Q/A 282-305.

d) (1c) wherein each of the files yields a different portion of the video on playback,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 306-15. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

e) (1d) wherein the files across the different copies yield the same portions of the video on playback, and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 316-28. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

f) (1e) wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and

Respondents' accused products, with the exception of MIRROR's MPEG-DASH system, meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 332-43.

Respondents concede the definition of "the term 'time index' is not at issue . . . because the plain and ordinary meaning of the term is clear." Resps. Br. at 54. Accordingly, all that remains is a factual question as to whether each of the relevant files comprises a time index.

Respondents argue that the accused products do not include time indexes because "they do not request files based on time indexes, and instead place requests based on Uniform Resources Identifiers (URIs), a unique identifier similar to a file name composed of letters and numbers, that do not include a time index or any information indicative of time." Resps. Br. at 56 (citing

[REDACTED]

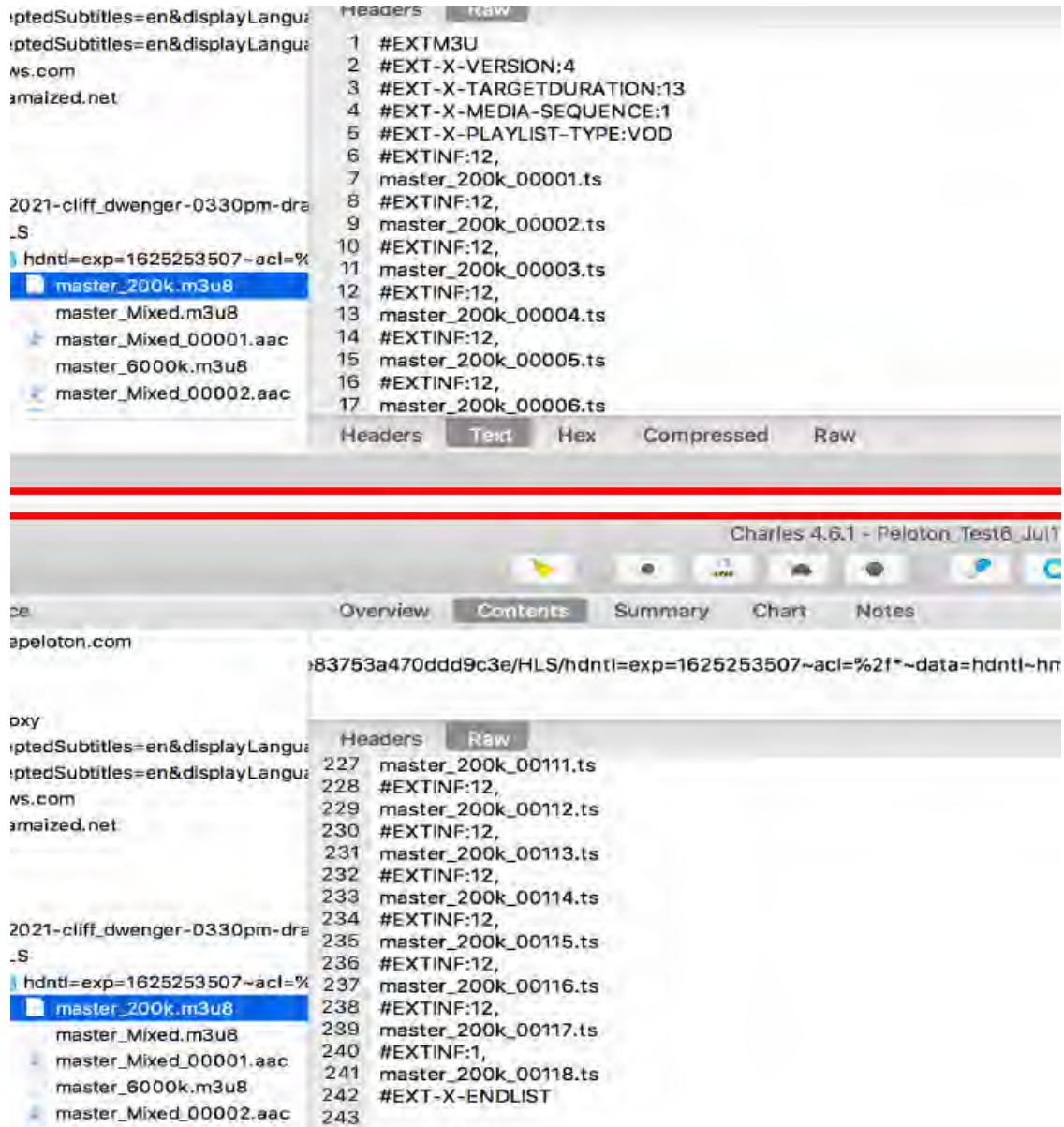
RX-0004C (Snoeren RWS) at Q/A 118, 121; Snoeren Tr. 303–304). However, as Dr. Snoeren testified, the accused products request segments “based on their filenames” and the filenames include a unique identifying number that “correspond[s] to their spot in the playback sequence.” RX-0004C (Snoeren RWS) at Q/A 123; Snoeren Tr. 305 (“it is a fact that that portion of the [Uniform Resource Identifier] string does have a number”), 319 (the incrementing numbers are “not random”), 320 (the numbers “correspond[] to their position in that media playlist”).

Respondents further contend that “the [Uniform Resource Identifiers] used to place the requests are not included with the requested HLS media segment.” Resps. Br. at 57 (citing RX-0004C (Snoeren RWS) at Q/A 118). However, the HLS standard explicitly states that “[e]ach segment in a Media Playlist has a unique integer Media Sequence Number.” CX-0836 (RFC 8216) 6, 23 § 3; § 4.3.3.3. Thus, the Media Sequence Number is contained in filename metadata such that each Media Segment has a unique Media Sequence Number, which is within the Media Segment file. Negus Tr. 142.

Respondents next object that DISH’s testing was flawed and that “the HLS protocol is not a compulsory protocol requiring strict compliance to play an HLS stream.” Resps. Br. at 59-60. However, DISH has adduced evidence demonstrating that respondents’ accused products indeed practice the HLS protocol using sequential Media Sequence Numbers. *See, e.g.*, JX-0080C (Brammer Dep.) 76:13-15, 77:23-78:6, 100:13-17, 157:13-16, 158:20-159:10; CX-0803 ([REDACTED] User Guide) at 81; CX-0806 ([REDACTED] User Guide) at 44-50, 97; JX-0077C (Santos Dep.) 155:4-7, 158:10-22, 159:14-160:24, 158:24-159:13.

As shown in Dr. Negus’s tests, each Media Segment includes a sequential Media Sequence number that starts at an initial value (00001 in CX-0712 below) for the first Media Segment and

increases sequentially to end at a larger number for the last Media Segment (00118 in CX-0712 below):



CDX-0010C.TEST.70 (CX-0712 (Peloton_Test6_Jul1_2021.chls)). Dr. Negus obtained similar test results for other accused products. CDX-0010C.TEST.148 (CX-0622 (Mirror_Test10_Jul2_2021.chls)); CDX-0010C.TEST.22 (CX-0751 (ICON_Test6_Jul1_2021.chls)).

Respondents additionally cite CX-0836 (RFC 8216) and RX-0055C (MIRROR .m3u8 file) to argue that the URI identified by DISH “is a string of characters that point to data.” Resps. Br. at 56. In computer code, characters readable by humans are representative of information. The factual issue here is whether the data conveyed by the characters is a time index. The URI contains information that is an index for the relative position in time of the Media Segment within the larger Media Sequence. As shown below, both CX-0836 and RX-0055C explicitly show multiple file names each having a unique integer Media Sequence Number that indexes the relative order of the file in time:

<p>8.1. Simple Media Playlist</p> <pre>#EXTM3U #EXT-X-TARGETDURATION:10 #EXT-X-VERSION:3 #EXTINF:9.009, http://media.example.com/first.ts #EXTINF:9.009, http://media.example.com/second.ts #EXTINF:3.003, http://media.example.com/third.ts #EXT-X-ENDLIST</pre> <p>CX-0836 (RFC 8216) at 51</p>	<p>chunks.m3u8</p> <pre>#EXTM3U #EXT-X-VERSION:3 #EXT-X-DISCONTINUITY-SEQUENCE:0 #EXT-X-TARGETDURATION:3 #EXT-X-MEDIA-SEQUENCE:1213 #EXT-X-PROGRAM-DATE-TIME: 2021-10-14T13:53:55.104Z #EXTINF:1.869, 0001566q/media_1213.ts #EXTINF:1.868, 0001566q/media_1214.ts #EXTINF:1.869, 0001566q/media_1215.ts #EXTINF:1.868, 0001566q/media_1216.ts #EXTINF:2.803, 0001566q/media_1217.ts #EXTINF:1.869, 0001566q/media_1218.ts</pre> <p>RX-0055C (MIRROR .m3u8 file)</p>
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DISH has thus adduced evidence showing that each of the respondents’ accused products, with the exception of MIRROR’s MPEG-DASH system,¹⁷ satisfy this claim limitation. *See, e.g.*, CX-0010C (Negus DWS) Q/A 332-43.

¹⁷ MIRROR argues that DISH did not adduce evidence showing that the MPEG-DASH system in the accused products utilizes “time indexes.” Resps. Br. at 61; RX-0004C (Snoeren RWS) at Q/A

g) (1f) wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 345-60.

Respondents contend that the accused products do not request the accused files based on time indexes. *See* Resps. Br. at 54-61. However, as I found above, each of the relevant files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video. *See supra* Sec. IX.A.1.f). Moreover, the ExoPlayer of each accused product requests the files "based on their filenames" and these filenames include a unique Media Sequence Number for each Media Segment. RX-0004C (Snoeren RWS) at Q/A 123; *see also* Snoeren Tr. 319–320. I thus find that the media player of each accused product streams the video by requesting a plurality of sequential files of one of the copies from the video server based on the time indexes. *See* CX-0010C (Negus DWS) at Q/A 345-60.

h) (1g) automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 364-70.

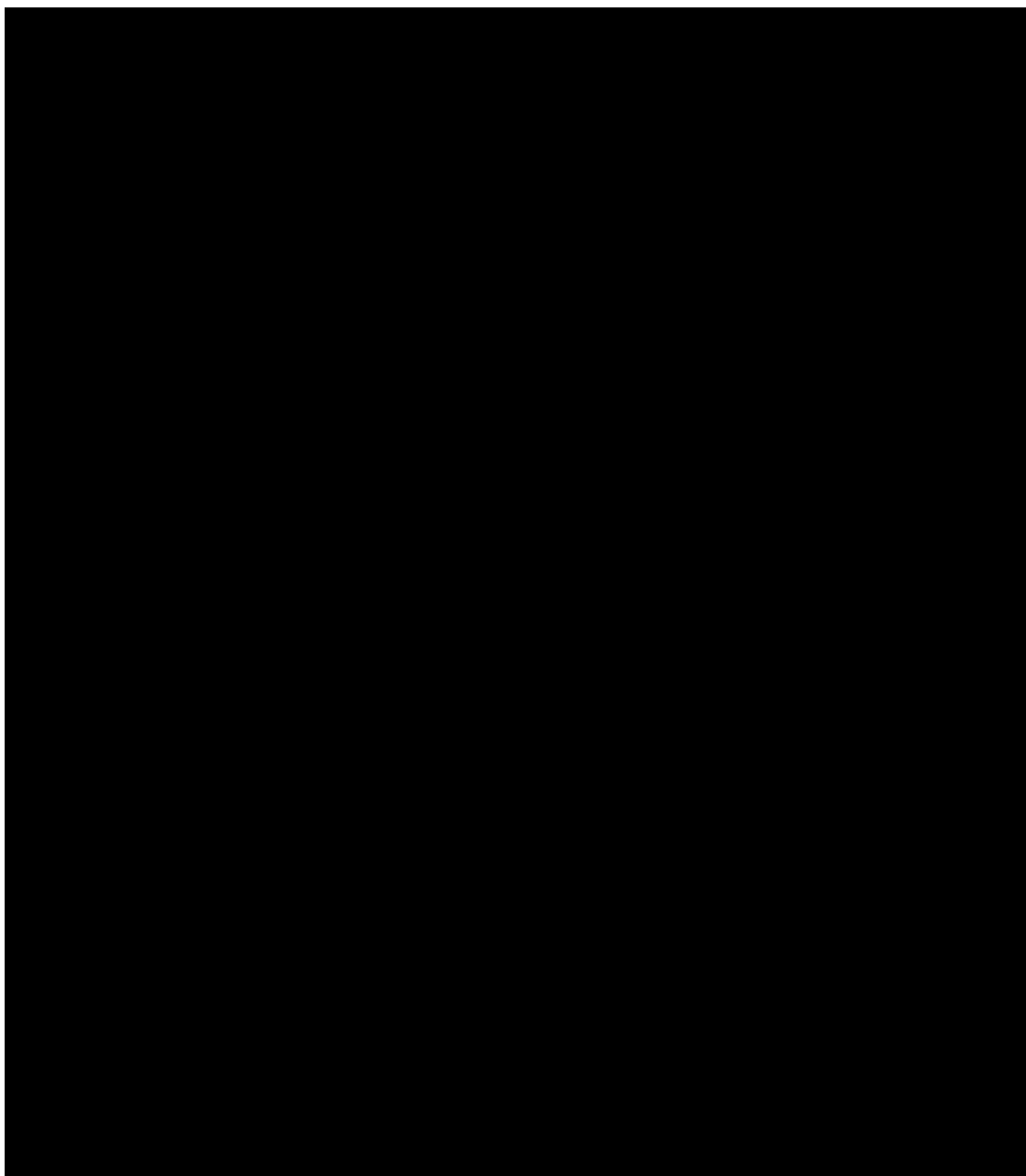
Respondents argue that "there is no evidence that the Accused Products select or playback videos based on quality. Instead, DISH pointed to the Accused Products selecting or playing back

131. DISH, however, does not accuse MIRROR's MPEG-DASH system of infringing the '564 patent, rendering MIRROR's argument moot.

[REDACTED]

videos based on bitrate.” Resps. Br. at 65. However, Dr. Negus identified and quoted the portions of respondents’ ExoPlayer source code demonstrating that streams are selected based on quality. CX-0010C (Negus DW) at Q/A 191, 203, 211. Specifically, the source code shows that the ExoPlayer within each accused product automatically requests video segments “dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies.” *See id.* at Q/A 365-66.

Comments in the source code itself demonstrate that the developers understood that the player shifts playback quality through selecting segments. As shown in the figure below, each time ExoPlayer retrieves a segment, it calls a function “[REDACTED],” which calls a function “[REDACTED],” which calls a function “[REDACTED].” *Id.* at Q/A 363-67 (citing CDX-0010C.IS.6–8 (CX-1000 (ExoPlayer r2.11.6)); CDX-0010C.PS.5-10 (CX-1001 (ExoPlayer r2.12.1)); CDX-0010C.MS.8 (CX-0999 (ExoPlayer r2.13.3))).



CDX-0010C.IS.7 (CX-1000 (ExoPlayer r2.11.6)) (modified). The emphasized comments refer to “higher quality” and “lower quality,” and indicate that the developers understood that the determination of the selected Variant Stream, which may indeed also relate to the bitrate of the Variant Stream, was nevertheless a shift in the playback quality to a higher or lower quality one of the different copies.

[REDACTED]

This source code analysis confirmed what Dr. Negus observed during his testing of the accused products. CX-0010C (Negus DWS) at Q/A 369 (citing CDX-0010C.TEST.15-17 for iFit (CX-0748, CX-0749, CX-0750), CDX-0010C.TEST.74, 80, 86, 93 for Peloton (CX-0713, CX-0714, CX-0715, CX-0716), and CDX-0010C.TEST.107-108, 146-155 for MIRROR (CX-0617, CX-0622)). In particular, the functions “[REDACTED]” and “[REDACTED]” make a “determination” to shift to one of a “higher quality” or a “lower quality” Variant Stream or not. *See id.* at Q/A 366. These functions can result in the ExoPlayer deciding to shift the playback quality to a higher or lower copy by changing which Variant Stream is the currently selected Variant Stream. *Id.*

[REDACTED]

CDX-0010C.IS.8 (CX-1000 ([REDACTED])).

As Dr. Negus testified:

[W]henver ExoPlayer executes the source code within the function “[REDACTED]” so as to set the value of “[REDACTED]” to the value of “[REDACTED]”, as shown for iFIT at CDX-0010C.IS.6–8, or so as to set the value of “[REDACTED]” to the value of “[REDACTED]”, as shown for Peloton at CDX-0010C.PS.5-10 and MIRROR at CDX-0010C.MS.8,

[REDACTED]

then this represents a “successive determination” by the “media player” NOT “to shift the playback quality to a higher or lower quality one of the different copies”, while, conversely, NOT setting the value of “[REDACTED]” to the value of “[REDACTED]”, as shown for iFIT at CDX-0010C.IS.6 – 8, or NOT setting the value of “[REDACTED]” to the value of “[REDACTED]”, as shown for Peloton at CDX-0010C.PS.6-8 and MIRROR at CDX-0010C.MS.8, represents a “successive determination” by the “media player” to shift the playback quality to a higher or lower quality one of the different copies”.

CX-0010C (Negus DWS) at Q/A 366.

Accordingly, I find that the accused products satisfy this limitation.

i) (1h) the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 372-92.

All products accused of infringing claim 1 use the ExoPlayer. DISH’s expert Dr. Negus identified four factors within the ExoPlayer source code that are indicative of the current ability to sustain the streaming of a video:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

j) (1i) making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 393-408.

Respondents contend that the accused products do not select or request video files by quality. *See* Resps. Br. at 65. However, above I found that each of respondents' accused products requests subsequent portions of a video dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality. *See supra* Sec. IX.A.1.h); CX-0010C (Negus DWS) at Q/A 393, 394, 400.

With respect to shifting based on thresholds, I found above that Dr. Negus identified at least four factors in the source code of the accused products that are indicative of the current ability to sustain the streaming of the video. Dr. Negus showed that ExoPlayer in each accused product performs such "successive determinations to shift the playback quality" specifically based on whether those factors are greater or less than different thresholds. CX-0010C (Negus DWS) at Q/A 393-408. The ExoPlayer therefore "upshifts to a higher quality one of the different copies

[REDACTED]

when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold.”

I find the accused products meet this limitation.

k) (1j) presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 409-17. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

l) Infringement Conclusion

With the exception of Peloton’s [REDACTED] and MIRROR’s MPEG-DASH system, which are not accused of infringing claim 1 of the ’564 patent, I find that respondents’ accused products meet each limitation of claim 1, and therefore respondents infringe that claim.

2. Claim 3

a) The end user station of claim 1, wherein the media player is configured to generate the factor according to the responses to segment requests.

As discussed above, the respondents’ accused products, with the exception of Peloton’s [REDACTED] and MIRROR’s MPEG-DASH system, satisfy all limitations of independent claim 1.

DISH has adduced evidence showing that each of the accused products comprises a media player configured to generate the factor according to the responses to segment requests. *See* CX-0010C (Negus DWS) at Q/A 418-22. Respondents do not contest that the accused products satisfy the additional limitation of claim 3. *See* Resps. Br. at 53-66.

[REDACTED]

With the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, which are not accused of infringing claim 3 of the '564 patent, I find that respondents' accused products meet claim 3, and therefore respondents infringe that claim.

3. Claim 4

a) The end user station of claim 1, wherein the media player is configured to upshift to the higher quality copy when the factor is greater than the first threshold and the media player determines the higher quality playback can be sustained according to a combination of factors.

As discussed above, the respondents' accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 1.

DISH has adduced evidence showing that each of the accused products comprises a media player configured to upshift to the higher quality copy when the factor is greater than the first threshold and the media player determines the higher quality playback can be sustained according to a combination of factors. *See* CX-0010C (Negus DWS) at Q/A 423-28. Respondents do not contest that the accused products satisfy the additional limitation of claim 4. *See* Resps. Br. at 53-66.

With the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, which are not accused of infringing claim 4 of the '564 patent, I find that respondents' accused products meet claim 4, and therefore respondents infringe that claim.

4. **Claim 5**

a) **The end user station of claim 1 wherein the media player is configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player.**

As discussed above, the respondents' accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 1.

DISH has adduced evidence showing that each of the accused products comprises a media player configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player. *See* CX-0010C (Negus DWS) at Q/A 429-35. Respondents do not contest that the accused products satisfy the additional limitation of claim 5. *See* Resps. Br. at 53-66.

With the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, which are not accused of infringing claim 5 of the '564 patent, I find that respondents' accused products meet claim 5, and therefore respondents infringe that claim.

B. Domestic Industry (Technical Prong)

DISH contends that the DISH Set-Top Boxes and the Sling TV Apps practice independent claim 1 of the '564 patent. *See* Compls. Br. at 122. Above I found that the Hopper 3 is representative of all DISH Set-Top Boxes after December 2017. *See supra* Sec. VIII.A. I also found, however, that DISH has not established that the Sling Fire App is representative of the Sling TV Apps. *See supra* Sec. VIII.B. The Staff argues that DISH has not established that the DISH

Set-Top Boxes and the Sling TV Apps practice claim 1 of the '564 patent because these products lack a display. *See* Staff Br. at 149-57.

1. Claim 1

a) (1pre) An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 679-83. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfy this limitation. *See* Resps. Br. at 99-108. To the extent the preamble of claim 1 is limiting, I find that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble.

b) (1a) a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 684-88. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfy this limitation. *See* Resps. Br. at 99-108.

c) (1b) wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 685-95.

Respondents argue that “DISH failed to show a particular server that stores ‘Media Segment files,’ nor does it show how a particular server would meet all of the claim requirements for ‘the video server.’” Resps. Br. at 99 (citing RX-0004C (Snoeren RWS) at Q/A 375-76).

[REDACTED]

As noted above in the infringement analysis of this same limitation, the limitation is met by a media player that streams a video from a server having at least two different copies of the same video stored in a least two sets of files. *See supra* Sec. IX.A.1.c). The claim does not preclude DISH from using multiple servers to provide its service.

The record evidence persuasively shows that the DISH Set-Top Boxes and the Sling Fire App each stream video from a single server that stores files as described in the claim. Dr. Negus testified that both the DISH Set-Top Boxes and the Sling Fire App use HTTP GET requests and responses in accordance with the HLS Standard to stream a video “composed of Media Segments from a ‘video server’ *including the specific case wherein such ‘video server’ is one of DISH’s Covered Servers.*” CX-0010C (Negus DWS) at Q/A 685, 687 (emphasis added). Dr. Negus substantiated this testimony with test results showing multiple files stored on the same server. *Id.* (citing CDX-0010C.TEST.158-164, 168-170, 173-174). Dr. Negus also noted an internal DISH document supported his expert opinion. *Id.* at 690. That document—prepared long before this litigation—states that a DISH Set-Top Box [REDACTED] [REDACTED] CX-0445C (Sling TV Overview) at 14. The media player in the device operates by [REDACTED] *Id.* (emphasis added). Dr. Negus testified that the DISH document reinforced his expert conclusion that “multiple different copies of the video encoded at different bit rates are stored on *the* video server as multiple sets of files.” CX-0010C (Negus DWS) at Q/A 690 (emphasis added).

Respondents further argue that DISH failed to show that in the DISH system content is stored as files on a server. *See Resps. Br.* at 99-100. However, as Dr. Negus testified, the servers within DISH’s content delivery networks store multiple Media Segment files, which make up the Variant Streams encoded at different bitrates. *See* CX-0010C (Negus DWS) at Q/A 690-92.

Moreover, Dr. Negus's testing identified the Uniform Resource Locator address of a particular movetv.com content delivery network server that stores the content that was streamed during the testing. *See, e.g.*, CDX-0010C.TEST.158 (CX-0812 (Live News Oct. 21)) (identifying a content delivery network server at Uniform Resource Locator "http://p-cdn1-a-cg14-linear-cbd46b77.movetv.com" for Sling Fire App testing); CDX-0010C.TEST.168 (CX-0814 (Live Sports Oct. 21)) (identifying a content delivery network server at Uniform Resource Locator "p-cdn1-601-cg15-linear-cbd46b77.movetv.com" for Hopper 3 testing). Dr. Negus's testing confirmed that the identified segments were in fact stored on the identified content delivery network server by (1) requesting the segments from the sets according to their Uniform Resource Identifiers and Uniform Resource Locators, (2) confirming those requests were successful, and (3) confirming that the requested segments were received from the content delivery network server. *See* CX-0010C (Negus DWS) at Q/A 693-95.

I find that use of the DISH Set-Top Boxes and the Sling Fire App includes a media player configured to stream a video from a server that stores multiple different copies of the video encoded at different bit rates as multiple sets of files, meeting this limitation. *See* CX-0010C (Negus DWS) at Q/A 685-95.

d) (1c) wherein each of the files yields a different portion of the video on playback,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 697-98. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 99-108.

e) (1d) wherein the files across the different copies yield the same portions of the video on playback, and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 700-01. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 99-108.

f) (1e) wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 703-04.

Respondents argue that “[t]he Sling TV for Amazon Fire does not perform this limitation for the same reasons why Respondents’ Accused Products do not meet this limitation.” Resps. Br. at 99. Respondents argue similarly regarding the Hopper 3. *See id.* at 103-04. As noted above with respect to the infringement analysis of this limitation, Respondents concede the definition of “the term ‘time index’ is not at issue . . . because the plain and ordinary meaning of the term is clear.” *See* Resps. Br. at 54; *supra* Sec. IX.A.1.f). Accordingly, all that remains is a factual question as to whether each of the relevant files comprises a time index.

Dr. Negus testified that the ExoPlayer in the Sling Fire App streams a video by using Media Segment files that incorporate Media Segment numbering, and this numbering functions as the recited “time index.” CX-0010C (Negus DWS) at Q/A 704. Dr. Negus also testified that [REDACTED] in the Hopper 3 operates “using the HLS standard,” and that standard explicitly states that “[e]ach segment in a Media Playlist has a unique integer Media Sequence Number.” *Id.* at Q/A 686, 703, 706; CX-0836 (RFC 8216) 6, 23 §3; §4.3.3.3; Negus Tr. 142. Dr. Negus confirmed these operations through testing. For example, when the Hopper 3 Set Top Box

selected [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] CX-0010C (Negus DWS) at Q/A 706; CDX-0010C.TEST.164, 168-170, 173, 174; CX-0814 (Hopper 3 Live News Oct 21.pcapng). When the Hopper 3 selected [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *Id.*; see also CX-0010C (Negus DWS) at Q/A 703, 706.

I find that use of the DISH Set-Top Boxes and the Sling Fire App includes a media player configured to stream video files comprising a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video . See CX-0010C (Negus DWS) at Q/A 702-707.

g) (1f) wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. See CX-0010C (Negus DWS) at Q/A 706-07. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. See Resps. Br. at 99-108.

h) (1g) automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. See CX-0010C (Negus DWS) at Q/A 710-17.

Respondents argue the Sling TV for Amazon Fire and the DISH Hopper 3 do not meet this limitation “for the same reasons as why Respondents’ Accused Products do not meet this

[REDACTED]

limitation.” Resps. Br. at 100-105. However, as I found above, respondents’ accused products include a media player that streams the video by automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies. *See supra* Sec. IX.A.1.h).

Moreover, as Dr. Negus testified, the Sling Fire App source code indicates that the ExoPlayer media player selects and identifies DASH streams by “quality.” CDX-0010.AS.7 (CX-0998 (Amazon ExoPlayer port r2.11.3)) (CX-0998 (Exoplayer)\\AdaptiveTrackSelection.java, lines 82-94) (showing ExoPlayer determines if “[t]he selected track is a higher quality” or if “[t]he selected track is a lower quality”). Likewise, the source code for [REDACTED] selects and identifies HTTP Live Streaming Streams by “quality.” [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Use of the DISH Set-Top Boxes and the Sling Fire App thus meets this limitation. *See* CX-0010C (Negus DWS) Q/A 710-17.

i) (1h) the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 719-32. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 99-108.

[REDACTED]

j) (1i) making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 733-44.

As with limitation 1g, respondents contend that the DISH Set-Top Boxes and the Sling Fire App do not select or request by quality for the same reasons that the accused products do not satisfy this limitation. *See* Resps. Br. at 100, 105. However, as I found above, each of respondents' accused products includes a media player that streams the video by making successive determinations to shift the playback quality to achieve continuous playback of the video using the files of the highest quality one of the different copies determined sustainable at that time. *See supra* Sec. IX.A.1.j); CX-0010C (Negus DWS) at Q/A 733-44. As Dr. Negus testified, [REDACTED] of the Hopper 3 selects and identifies the HLS Streams by "quality," and source code for the Sling Fire App similarly indicates that the ExoPlayer media player also selects and identifies DASH streams by "quality." *See id.*

k) (1j) presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

Respondents argue that "DISH cannot establish a technical domestic industry because its two domestic industry products (a set-top box and software application) do not include anything

[REDACTED]

that can present or provide a video to a user for playback of that video.” *See* Resps. Br. at 88-89.¹⁸ Respondents contend that DISH has failed to identify the “articles protected by the patent” because DISH has only asserted products lacking a display as its domestic industry products. *See id.* at 89; 19 U.S.C. § 1337(a)(2), (3). The Staff agrees with respondents that DISH has not met its burden to show that its domestic industry products practice this limitation because DISH’s domestic industry products lack displays. *See* Staff Br. at 149-57.

DISH does not contend that the DISH Set-Top Boxes and the Sling Fire App include a display, and instead argues that it satisfies the technical prong because its products are used with compatible third-party displays. *See* Compls. Br. at 161-67.

If a complainant’s products do not practice a patented invention standing alone, “the technical prong of the domestic industry requirement may still be satisfied if it can be established that [the complainant] or its customers configure the allegedly covered products in a manner that practices the claims within the United States.” *Certain Optoelectronic Devices, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-669, ID at 101 (Mar. 12, 2010) (unreviewed). The Commission has also found that the technical prong of the domestic industry may be satisfied when a complainant’s domestic industry product is used with compatible third-party devices. *See Certain Magnetic Tape Cartridges and Components Thereof*, Inv. No. 337-TA-1058, Comm’n Op. at 29 (Apr. 9, 2019).

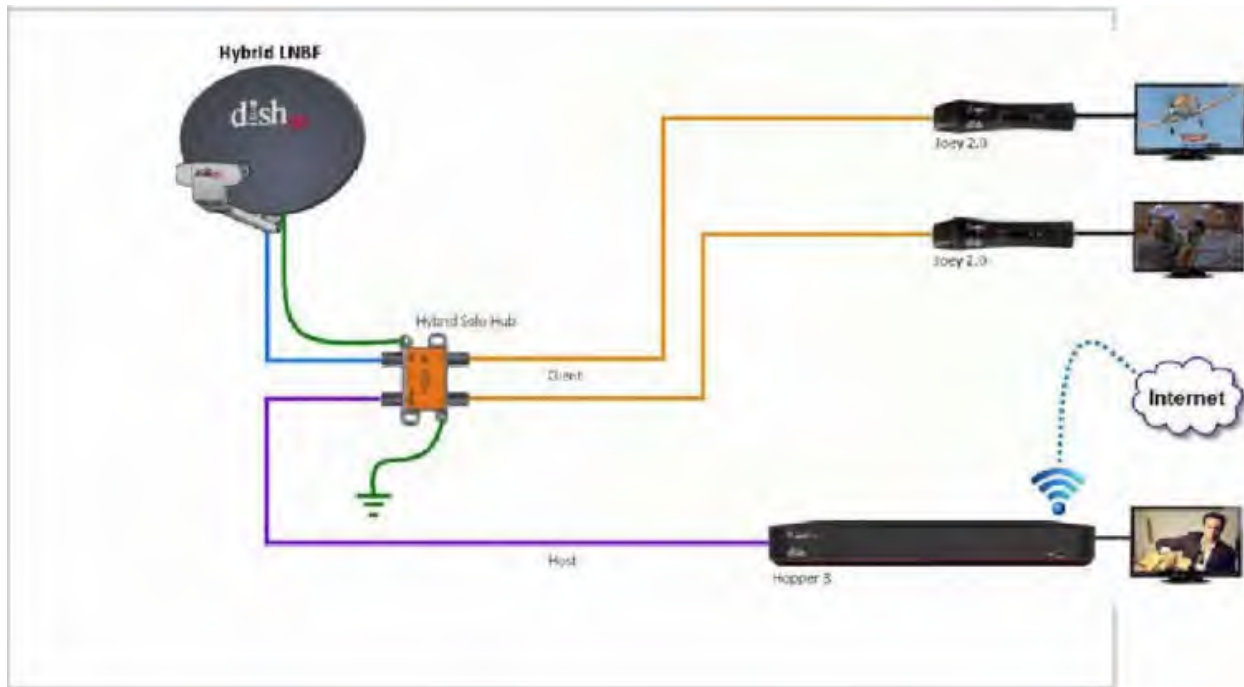
¹⁸ Respondents and the Staff argue that practicing this limitation requires a display. *See* Resps. Br. at 94-96, Staff Br. at 149-58. DISH argues that it does not. *See* Compls. Br. at 11-25. No party presented this as an issue of claim construction. I need not decide whether claim 1 requires a display because, no matter whether the claims require a display or not, the record demonstrates that the DISH Set-Top Boxes and the Sling Fire App in fact provide data streams to displays viewed by users.

[REDACTED]

Based on the evidence and arguments of the parties, I find that DISH established by a preponderance of the evidence that: (1) DISH's customers use the invention of claim 1 of the '564 patent when they view videos streamed through the DISH Set-Top Boxes onto their televisions or other displays, and (2) DISH's customers use the invention of claim 1 of the '564 patent when they use the Sling Fire App to stream videos onto their televisions or other displays.

First, DISH adduced evidence of actual usage data, showing that DISH TV and Sling TV customers in fact use the DISH Set-Top Boxes and the Sling Fire App to view streaming content in the intended manner. *See* CX-0002C (Kroonenberg DWS) at Q/A 23; CX-0007C (Vander Veen DWS) at Q/A 31, 35; CX-0038C; CX-0039C; Mulhern Tr. 593-600; CX-0072C (2020 Market Data) at "Custom" Tab, Rows 78-84. This evidence weighs in favor of a finding that DISH's customers use the Set-Top Boxes and the Sling Fire App in a manner that practices claim 1 of the '564 patent. *See, e.g., Certain Elec. Imaging Devices*, Inv. No. 337-TA-850, Comm'n Op. at 15 (Apr. 21, 2014) (citing *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1318-19 (Fed. Cir. 2009)).

Second, DISH presented evidence showing that DISH instructs customers to connect the DISH Set-Top Boxes and the Sling Fire App to displays, such as the customers' televisions. *See* CX-0002C (Kroonenberg DWS) at Q/A 55; CX-0062 (Hopper Installation Manual) 1, 3, 4; CX-0214C-SC ([14] av_digital_display_interface) 29, 34; CX-0445C (Sling TV Overview) at 2.



CX-0062 (Hopper Installation Guide) at 1.

Indeed, federal regulatory filings confirm that DISH has described the use of its services with third-party devices that include “televisions, streaming media devices, tablets, phones and computers.” CX-1037 (DDBS Corp. 2019 10-K) at 40.

Respondents cite *Certain Mobile Devices, Associated Software and Components Thereof* (“*Mobile Devices*”), Inv. No. 337-TA-744, and argue that DISH, like the complainant in that investigation, failed to provide sufficient proof of an actual domestic industry product that practices the patent. *See* Resps. Reply Br. at 31. However, the administrative law judge in *Mobile Devices* found that there was insufficient proof of the technical prong when complainant’s expert only examined source code provided by the complainant, and it was undisputed that additional source code provided by a third party was necessary to practice the claim. *See Mobile Devices*, ID at 204-05, *Microsoft Corp. v. Int’l Trade Comm’n*, 731 F.3d 1354, 1363 (Fed. Cir. 2013) (complainant “did not offer sufficient evidence to prove that any third-party mobile device

implements a hardware-dependent driver layer as required by the patent”). In contrast, the record here contains abundant evidence that DISH customers connect DISH Set-Top Boxes and the Sling Fire App to televisions, phones, computers, and tablets, as noted above.

Respondents further cite *Broadcom Corp. v. International Trade Commission*, where the Federal Circuit affirmed that the complainant failed to identify any “specific” integration of the domestic industry product with necessary third-party firmware to meet the technical prong of the domestic industry requirement. *See* Resps. Reply Br. at 31-32 (citing 28 F.4th 240, 250 (Fed. Cir. 2022)). But *Broadcom* is readily distinguished from the facts here. In *Broadcom*, both the ALJ and the Commission found insufficient documentary or testimonial evidence to support an assertion that devices were integrated in manner that resulted in the claimed invention. *Certain Infotainment Systems, Components Thereof, and Automobiles Containing the Same*, Inv. No. 337-TA-1119, Comm’n Op. at 20-23 (May 28, 2020). No such deficiency exists here. DISH has adduced specific evidence showing that DISH’s customers in fact use the DISH Set-Top Boxes and the Sling Fire App in a manner that practices claim 1 of the ’564 patent and that DISH actively assists its customers in implementing the Set-Top Boxes and the Sling Fire App with third-party devices that include displays. *See supra*. DISH has also presented specific, corroborated evidence showing that both the Set-Top Boxes and the Sling Fire App, when combined with the customer’s television or other display, are indeed used to present a video to the user. *See, e.g.*, CX-0062 (Hopper Installation Manual); CX-0445C (Sling TV Overview). DISH has identified actual instances of usage where the Set-Top Boxes and the Sling Fire App are used to present video to users. *See* CX-0038C (DISH TV Usage); CX-0039C (Sling TV Usage); CX-0072C (2020 Market Data) at “Custom” Tab, Rows 78-84.

l) Technical Prong Conclusion

I find that each limitation of claim 1 is met at least when DISH's customers use the DISH Set-Top Boxes and the Sling Fire App in their intended and authorized manner. Indeed, if those uses were not authorized by DISH, there would be infringement, and that is the test for the technical prong of the domestic industry requirement. *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003) ("The test for satisfying the 'technical prong' of the industry requirement is essentially [the] same as that for infringement, *i.e.*, a comparison of domestic products to the asserted claims."). The DISH Set-Top Boxes and the Sling Fire App are therefore "articles protected by the patent" within the meaning of section 337. *See* 19 U.S.C. § 1337(a)(3). I determine DISH has satisfied the technical prong of the domestic industry requirement for claim 1 of the '564 patent.

2. Claim 3

a) The end user station of claim 1, wherein the media player is configured to generate the factor according to the responses to segment requests.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 1.

DISH has adduced evidence showing that use of each of the DISH Set-Top Boxes and the Sling Fire App comprises a media player configured to generate the factor according to the responses to segment requests. *See* CX-0010C (Negus DWS) Q/A 751-56. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the additional limitation of claim 2. *See* Resps. Br. at 94-108.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets claim 3. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 3.

3. Claim 5

a) The end user station of claim 1 wherein the media player is configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 1.

DISH has adduced evidence showing that use of each of the DISH Set-Top Boxes and the Sling Fire App comprises a media player configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player. *See* CX-0010C (Negus DWS) at Q/A 764-69. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the additional limitation of claim 5. *See* Resps. Br. at 94-108.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets claim 5. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 5.

X. THE '156 PATENT

A. Infringement

DISH contends that iFit, Peloton, and MIRROR infringe independent claim 1 and dependent claim 5 of the '156 patent with accused products that implement the HLS Standard

[REDACTED]

(including Peloton's [REDACTED]) and MPEG-DASH. *See* Compls. Br. at 103. DISH contends that Peloton infringes dependent claim 2 of the '156 patent with accused products that implement the HLS Standard (including Peloton's [REDACTED]). *See id.* DISH contends that the iFit, Peloton, and MIRROR accused products infringe dependent claim 4 of the '156 patent when practicing live streaming with accused products that implement the HLS Standard (including Peloton's [REDACTED]). *See id.* The Staff argues that respondents do not infringe claim 1 of the '156 patent because the accused products do not request sequential streamlets of one of the copies from the video server according to the playback times of the streamlets. *See* Staff Br. at 100-03. The Staff further argues that DISH has not met its burden of showing that the accused products infringe claim 5 of the '156 patent. *See id.* at 109.

1. Claim 1

a) (1pre) An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising:

The parties do not appear to dispute whether the preamble to claim 1 is limiting. *See* Compls. Br. at 103, Resps. Br. at 66-76. Respondents do not contest that the accused products satisfy the preamble. *See* Resps. Br. at 66-76. To the extent that the preamble is limiting, I find that each of respondents' accused products is an apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network. *See* CX-0010C (Negus DWS) at Q/A 614-15.

b) (1a) a media player operating on the apparatus, wherein the media player is configured to stream the video from the video server via at least one transmission control protocol (TCP) connection over the network,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 616. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

c) (1b) wherein the video server stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets,

DISH has adduced evidence showing that respondents' accused products practice this limitation.

Respondents argue that “[b]ecause DISH failed to show that Respondents infringe claim 1(b) of the ’564 patent, DISH has also failed to show that Respondents infringe claims 1, 4, and 7 of the ’156 patent.” Resps. Br. at 70. However, above I found that the accused products stream video from a server that stores multiple different copies of the video encoded at different bit rates as multiple sets of files. *See infra* Sec. IX.A.1.c). A “streamlet” is “any sized portion of the content file.” *See supra* Sec. VII.B.1. The files I examined with respect to claim 1 of the ’564 patent included files which are a portion of a content file. For example, Dr. Negus testified that the .ts Media Segment files he downloaded were “portions of the video for multiple Variant Stream[s] of the program.” *See* CX-0010C (Negus DWS) at Q/A 150, 154, 158. I therefore find that these files are streamlets. The record evidence demonstrates that respondents' accused products interact with a video server that stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets. *See* CX-0010C (Negus DWS) at Q/A 617-18.

Respondents also contend that Peloton's [REDACTED] does not infringe under respondents' construction of the term “streamlets.” *See* Resps. Br. at 76. As Dr. Negus testified,

each HLS Media Segment for an [REDACTED] is “a different portion of the overall video content.” *See* CX-0010C (Negus DWS) at Q/A 621.

I find respondents’ accused products satisfy this limitation.

d) (1c) wherein each of the streamlets yields a different portion of the video on playback,

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 619-22. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

e) (1d) wherein the streamlets across the different copies yield the same portions of the video on playback, and

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 623-25. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

f) (1e) wherein the streamlets in the different copies are aligned in time such that the streamlets that play back the same portion of the video for the different copies each begin at the same playback time in relation to the beginning of the video, and

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 626-28. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

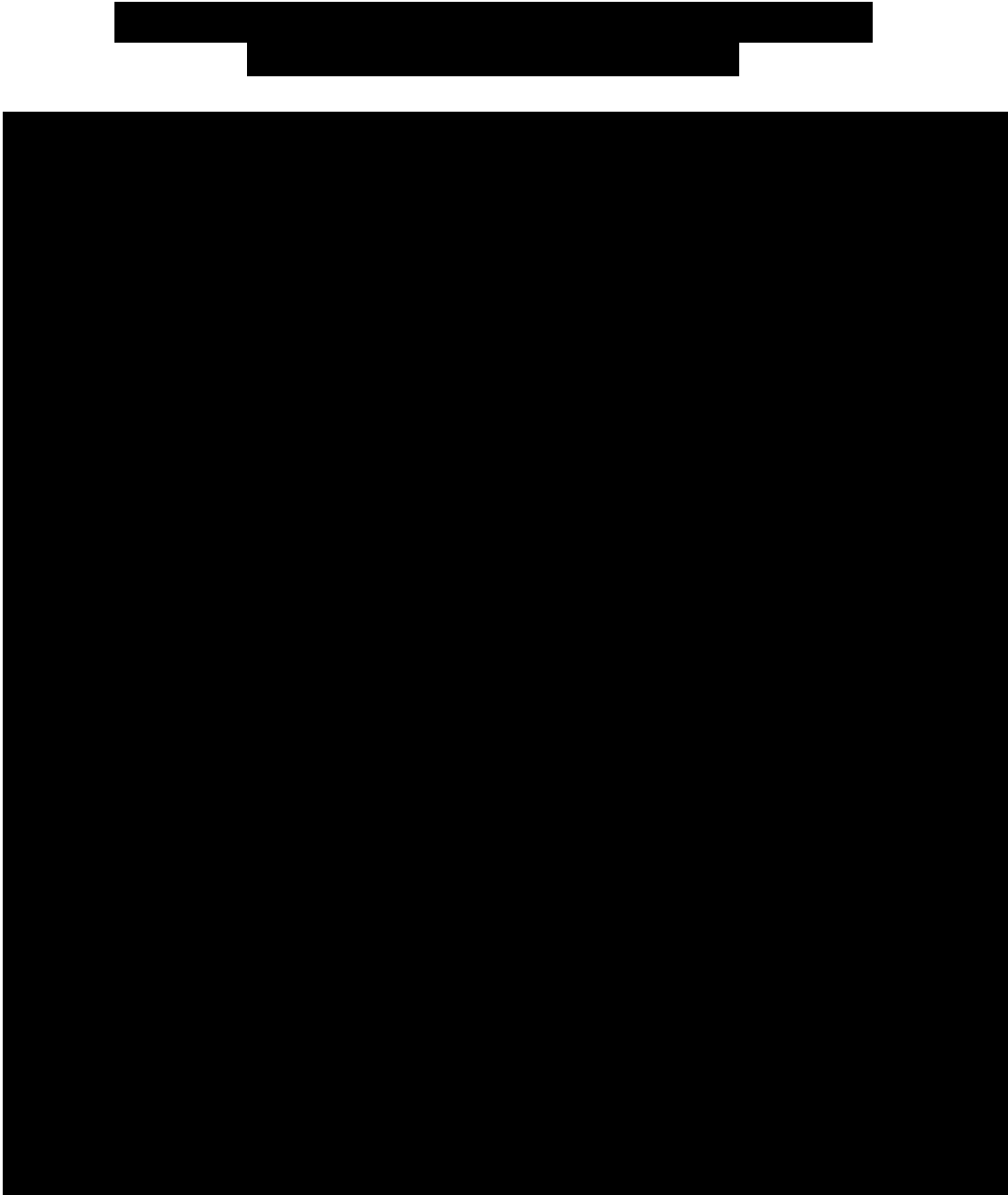
g) (1f) wherein the media player streams the video by: requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server;

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 629-35.

Respondents argue that “claim 1 of the ’156 patent requires requesting files based on a playback time that indicates the beginning playback time of the video contained in the portion of the requested streamlet.” Resps. Br. at 67. However, as Dr. Snoeren testified, the accused products request segments “based on their filenames” and the filenames include a unique identifying number that “correspond[s] to their spot in the playback sequence.” RX-0004C (Snoeren RWS) at Q/A 123; Snoeren Tr. 305 (“it is a fact that that portion of the [Uniform Resource Identifier] string does have a number”), 319 (the incrementing numbers are “not random”), 320 (the numbers “correspond[] to their position in that media playlist”). Moreover, the HLS Standard explicitly states that “[e]ach segment in a Media Playlist has a unique integer Media Sequence Number.” CX-0836 (RFC 8216) 6, 23 § 3; § 4.3.3.3. Thus, the Media Sequence Number is contained in streamlet metadata and it corresponds to the playback times of the streamlets. Negus Tr. 142.

Respondents further argue that DISH’s analysis does not show that the streamlets are requested based on playback times, because the analysis only shows how the streamlets are played back. *See* Resps. Br. at 68. In this regard, Dr. Negus analyzed the following source code of the ExoPlayer:

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CDX-0010C.PS.6 (CX-1001 (ExoPlayer-r2.12.1)); *see also* CDX-0010C.IS.6 (CX-1000 (ExoPlayer-r2.11.6)); CDX-0010C.MS.6 (CX-0999 (ExoPlayer-r2.13.3)). Regarding the above source code, Dr. Negus testified:

Yeah, so overall this is an excerpt within a demonstrative that I made to help, help anyone on this project. And so this is from a source code file. [REDACTED]

And it does two important things relative to the asserted claims. Kind of the first, if you look at below the double slash where it says [REDACTED] in there, yeah,

[REDACTED]

that part is basically how it determines whether it wants to upshift or downshift. It calls other functions and the details are in the other functions. But then if we go to the next part, just below that, that says [REDACTED]

In other words, how do you put together that URI that we were speaking about. [REDACTED], and that's calling a function. And this function considers a number of parameters.

And among them are what's called -- the very last one there is called [REDACTED].

[REDACTED] **is simply where you are in the overall video measured in playback time. So measured in time relative to the beginning of the video.** And so that's what's used in order to figure out what is the next media sequence or media sequence number that will be played or will be downloaded, I should say, using HTTP, will be retrieved from the server.

So, in other words, when it is requesting the sequential files, it is doing it according to the playback times.

Negus Tr. 148-149 (emphasis added). As Dr. Negus testified, the ExoPlayer source code of each accused product demonstrates that the requesting of sequential files based on the media sequence numbers is performed “according to the playback time ... relative to the beginning of the video.” *Id.*

The Staff argues that “Respondents’ sequential Media Sequence numbers in [Uniform Resource Identifier] filenames are requested by the Accused Products based on where the files, or media segments, are in relation to the video. This request may be *indicative* of time, but it is not *according* to the *times* at which the streamlets are *played*.” Staff Br. at 100 (emphasis in original). Yet the evidence shows each of respondents’ Media Segments are listed or identified in sequential order according to their sequential playback times and ExoPlayer individually requests each Media Segment in that sequential order according to “where you are in the overall video measured in

playback time.” Negus Tr. 149; CX-0836 (RFC 8216) 4. Thus, the accused products request sequential streamlets “according to the playback times.”

Respondents further argue that “[t]he plain language of claim 1(f) of the ’156 Patent requires making a request for ‘sequential streamlets’ and thus requires placing *one* request for *multiple* files.” Resps. Br. at 69 (emphasis in original). This argument is a variation of respondents’ claim construction argument in connection with claim 10 of the ’555 patent, where respondents argued that the phrase “receive the requested streamlets” requires more than one streamlet to be received in response to a single request. *See supra* Sec. VII.B.2. Neither argument is persuasive. In both circumstances, respondents’ interpretation of the claim is inconsistent with the specification and the idiomatic use of the plural in each context. Respondents admit the patent specification teaches the request may be for one streamlet or multiple streamlets. Resps. Br. at 32 (“The parties and the Staff agree that the specification discloses different embodiments, including: (1) one in which a single request is placed for a single streamlet, and (2) another in which a single request is placed for multiple streamlets simultaneously.”). The idiomatic use of the plural in this context “can describe a universe ranging from one to some higher number.” *See Versa Corp. v. Ag-Bag Int’l Ltd.*, 392 F.3d 1325, 1330 (Fed. Cir. 2004) (claimed “means for creating air channels” did not require more than one channel to be created). The phrase “requesting sequential streamlets” in claim 1 of the ’156 patent does not mean that a single request must seek multiple files. As has been discussed at length, the evidence shows the accused products request sequential streamlets.

Respondents further argue that this limitation requires transmission of an “(HTTP) GET request” but the accused products instead use an encrypted HTTPS GET request. Resps. Br. at 70. I find the accused products transmit an HTTP GET request because the encrypted HTTPS GET

request used by the accused products is a type of HTTP GET request. *See* CX-0010C (Negus DWS) at Q/A 635. As Dr. Negus testified, the primary difference between HTTP and HTTPS is that HTTPS adds encryption to HTTP, which means that a given HTTPS request “includes an HTTP request.” *See id.*

(1) MPEG-DASH

DISH relies on different evidence to show that MIRROR’s MPEG-DASH system meets this limitation. DASH (Dynamic Adaptive Streaming over HTTP) is a “media-streaming model for delivery of media content in which control lies primarily with the client,” which allows clients to “request data using the HTTP protocol from standard web servers that have no DASH-specific capabilities.” CX-0612 (DASH 2019) at 21. In DASH, a Media Presentation Description (MPD) “defines formats to announce resource identifiers for Segments and to provide the context for these identified resources within a Media Presentation” wherein such “resource identifiers are HTTP-URLs possibly combined with a byte range, or with a data URL.” *Id.* at 19.

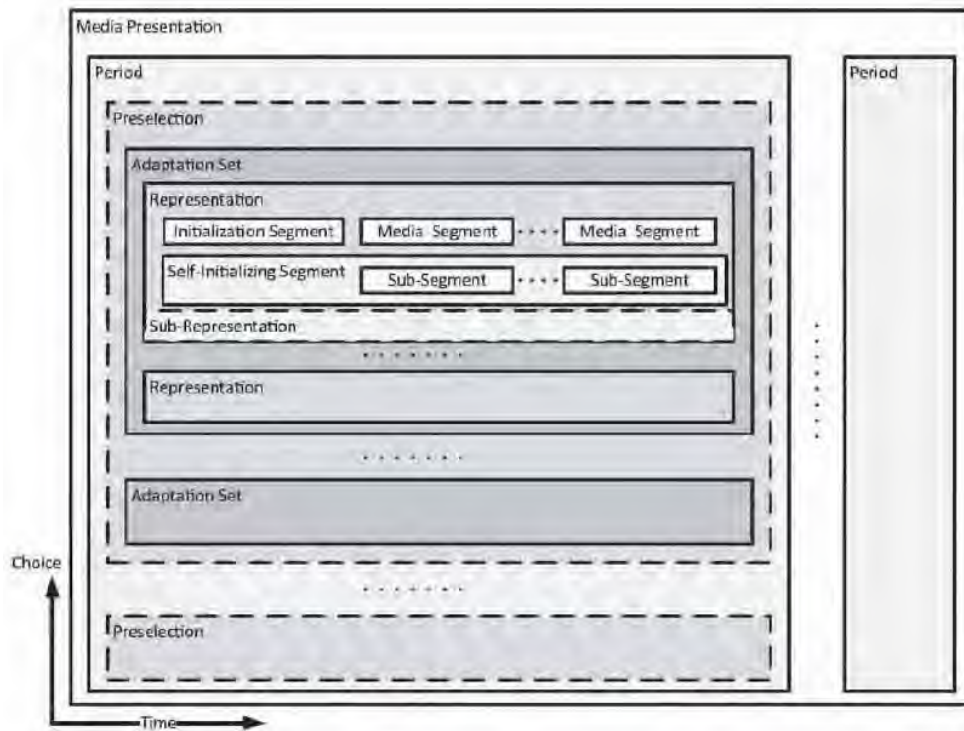


Figure 3 — DASH High-Level Data Model

CX-0612 (DASH 2019) at 22.

In MPEG-DASH, each representation “share[s] a common timeline” such that the “presentation time of each access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.” CX-0010C (Negus DWS) at Q/A 630 (quoting CX-0612 (DASH 2019)).

Respondents argue that DISH’s expert, Dr. Negus, did not provide any evidence that MIRROR’s MPEG-DASH implementation practices this limitation. *See* Resps. Br. at 69. Yet Dr. Negus testified:

The third depicted step in my block diagram of CDX-0010C.MS.3 includes creating or updating a media segment list, whether for HLS or DASH, that reflects the currently selected HLS Variant Stream or DASH Representation. In ExoPlayer, a

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[REDACTED]

particular HLS Variant Stream or DASH Representation is usually referred to as a “track” (see, for example, CX-0462 <https://exoplayer.dev/track-selection.html>). . .

.

For either HLS or DASH, a key function for these combined steps is

[REDACTED]

CX-0010C (Negus DWS) at Q/A 201.

CDX-0010C.MS.5. Hence, [REDACTED]

[REDACTED]

[REDACTED]. See CX-0010C (Negus DWS) at Q/A 201. DISH has

adduced evidence showing that the ExoPlayer in MIRROR's MPEG-DASH system requests sequential streamlets of one of the copies from the video server according to the playback times.

Accordingly, respondents' accused products, including the MIRROR MPEG-DASH system, meet this limitation.

h) (1g) wherein the sequential streamlets are selected by the media player from the based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 636-38.

Respondents argue that "[b]ecause DISH failed to prove infringement of claim 1 of the '564 patent for this claim element (*see supra* Section VII.A.3), it also failed to prove infringement of claim 1 of the '156 patent." Resps. Br. at 72. However, above I found that DISH has adduced evidence showing that respondents' accused products include a media player that selects sequential streamlets based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video. *See supra* Sec. IX.A.1.h); CX-0010C (Negus DWS) at Q/A 636-38.

Accordingly, DISH has adduced evidence showing that the accused products satisfy this limitation.

i) (1h) repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 639-41. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

j) (1i) adapting the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time; and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 642-46.

Respondents contend that the accused products do not select or request by quality. *See* Resps. Br. at 72. However, as I found above, each of respondents' accused products adapts the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time. *See supra* Sec. IX.A.1.j). Dr. Negus's analysis of the source code shows that ExoPlayer performs such "successive determinations to shift the playback quality" specifically "based on the factor." *See* CX-0010C (Negus DWS) at Q/A 642-46.

k) (1j) presenting the video for playback by providing the requested streamlets in order of ascending start time.

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 647-49. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

l) Infringement Conclusion

I find that respondents' accused products meet each limitation of claim 1 of the '156 patent, and therefore respondents infringe that claim.

2. Claim 2

a) The apparatus of claim 1, wherein the apparatus is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates.

DISH only accuses Peloton of infringing claim 2. As discussed above, the Peloton accused products satisfy all limitations of independent claim 1.

DISH has adduced evidence showing that the Peloton accused products are configured to establish multiple Transmission Control Protocol (TCP) connections with a content server and request streamlets of varying bitrates. *See* CX-0010C (Negus DWS) at Q/A 650-55.

Peloton argues that “the claim requires two separate components—a video server and a content server—and there is no evidence that a single IP address establishes that two separate computers are present.” Resps. Br. at 75 (citing RX-0004C (Snoeren RWS) at Q/A 217). However, the specification teaches that “video” is a type of “content,” so the “content server” recited in claim 2 is broad enough to encompass the “video server” recited in claim 1. JX-0004 (’156 patent) at 6:57-59. Because the Peloton accused products establish multiple TCP connections with a video server, and because that video server is a content server, the Peloton accused products meet claim 2. I therefore find Peloton infringes that claim.

3. Claim 4

a) The apparatus of claim 1, wherein the requesting the sequential streamlets comprises the apparatus transmitting hypertext transport protocol (HTTP) GET requests for selected streamlets, wherein each of the HTTP GET requests identifies the separate file stored by the video server that corresponds to the requested streamlet.

As discussed above, the respondents’ accused products satisfy all limitations of independent claim 1.

[REDACTED]

DISH has adduced evidence showing that each of the accused products satisfies this claim limitation when practicing live streaming. *See* CX-0010C (Negus DWS) at Q/A 656-58. Respondents argue that the accused products do not transmit HTTP GET requests when requesting streamlets because they transmit HTTPS GET requests. *See* Resps. Br. at 70-72. However, above I found that an HTTPS GET request is a type of HTTP GET request. *See supra* Sec. IX.A.1.g).

With the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system,¹⁹ I find that respondents' accused products meet claim 4, and therefore respondents infringe that claim.

4. Claim 5

a) The apparatus of claim 1 wherein each of the streamlets of each of the different copies is independently requestable and playable by the apparatus.

As discussed above, the respondents' accused products satisfy all limitations of independent claim 1.

For the reasons discussed below, DISH has not adduced evidence showing that each of the streamlets of each of the different copies is independently requestable and playable by the apparatus.

DISH argues that "the Media Segments are each 'specified by a [Uniform Resource Identifier]' and are retrieved by individual HTTP GET requests are therefore 'individually

¹⁹ The Peloton [REDACTED]. *See* Compls. Reply Br. at 24 n.11. DISH only asserts claim 4 against accused products used for live streaming. *See* Compls. Br. at 112. I therefore find that DISH has not adduced evidence showing that Peloton infringes claim 4 of the '156 patent with [REDACTED]. Similarly, as DISH does not contend that MIRROR's MPEG-DASH system is used for live streaming, *see* Compls. Br. at 94, 103, I find that DISH has not adduced evidence showing that MIRROR infringes claim 4 of the '156 patent with its MPEG-DASH system.

requestable.’” Compls. Br. at 112-13 (quoting CX-0010C (Negus DWS) at Q/A at 660). However, even though each Media Segment is requested individually, it is not independently requestable because each Media Segment cannot be requested until the Media Segment immediately before it is requested. *See* RX-0004C (Snoeren RWS) at Q/A 168-82. As Dr. Snoeren testified, the ExoPlayer cannot request a Media Segment in the middle of the order listed in the Media Playlist unless the preceding Media Segment has already been requested. *See id.*

I find that respondents’ accused products do not meet each limitation of claim 5, and therefore respondents do not infringe that claim.

B. Domestic Industry (Technical Prong)

DISH contends that the DISH Set-Top Boxes and the Sling TV Apps practice independent claim 1 and dependent claim 4 of the ’156 patent. *See* Compls. Br. at 122. Above I found that the Hopper 3 is representative of all DISH Set-Top Boxes after December 2017. *See supra* Sec. VIII.A. I also found, however, that DISH has not established that the Sling Fire App is representative of the Sling TV Apps. *See supra* Sec. VIII.B. The Staff argues that DISH has not established that the DISH Set-Top Boxes and the Sling TV Apps practice claim 1 of the ’156 patent because these products lack a display, *see* Staff Br. at 149-57, and because these products do not request sequential streamlets of one of the copies from the video server according to the playback times of the streamlets, *see id.* at 146-49.

1. Claim 1

a) (1pre) An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising:

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 853. Respondents do not contest that use of the DISH Set-Top

Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108. To the extent the preamble of claim 1 is limiting, I find that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble.

b) (1a) a media player operating on the apparatus, wherein the media player is configured to stream the video from the video server via at least one transmission control protocol (TCP) connection over the network,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 854. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfy this limitation. *See* Resps. Br. at 94-108.

c) (1b) wherein the video server stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 855.

Respondents argue that DISH failed to show that the Sling Fire App and the Hopper 3 practice the “video server” limitation for the same reasons as those argued regarding the ’564 patent. *See* Resps. Br. at 101, 106. However, as I found above, the Sling Fire App and the Hopper 3 practice the “video server” limitation of the ’564 patent. *See supra* Sec. IX.B.1.c).

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 690-94, 855-56.

d) (1c) wherein each of the streamlets yields a different portion of the video on playback,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 857. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

e) (1d) wherein the streamlets across the different copies yield the same portions of the video on playback, and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 858. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

f) (1e) wherein the streamlets in the different copies are aligned in time such that the streamlets that play back the same portion of the video for the different copies each begin at the same playback time in relation to the beginning of the video, and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 859. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

g) (1f) wherein the media player streams the video by: requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 860-61.

Respondents contend that the Sling Fire App and the Hopper 3 do not meet the “playback times of the streamlets” claim limitation for the same reasons that respondents’ accused products do not meet this limitation. *See* Resps. Br. at 54-61. However, above I found that respondents’ accused products do meet this limitation. *See supra* Sec. X.A.1.g). Moreover, DISH has adduced evidence showing that the HTTP Live Streaming standard explicitly states that “[e]ach segment in a Media Playlist has a unique integer Media Sequence Number.” CX-0836 (RFC 8216) 6, 23 §3; §4.3.3.3. Thus, the Media Sequence Number is contained in filename metadata such that each Media Segment has a unique Media Sequence Number, which is within the Media Segment file. Negus Tr.



142. As Dr. Negus testified, the ExoPlayer of the Sling Fire App streams the video by using HTTP GETs to individually retrieve time sequenced Media Segments based on the DASH Media Segment number. *See* CX-0010C (Negus DWS) at Q/A 707. Hence, the Media Sequence Numbers satisfy the “playback times of the streamlets” limitation. *See id.* at Q/A 860-61.

h) (1g) wherein the sequential streamlets are selected by the media player from the based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 862-63.

Respondents argue that DISH failed to show that the Sling Fire App and the Hopper 3 identify a video stream by “quality” to shift or select a stream for playback for the same reasons as argued regarding the ’564 patent. *See* Resps. Br. at 101, 106. However, above I found that the Sling Fire App and the Hopper 3 practice the “quality” limitation of the ’564 patent. *See supra* Sec. IX.B.1.h).

Moreover, as Dr. Negus testified, the Sling Fire App source code indicates that the ExoPlayer media player selects and identifies DASH streams by “quality.” *See* CDX-0010C.AS.7 (CX-0998). The source code for [REDACTED] likewise selects and identifies HLS Streams by “quality.” *See* CDX-0010C.HS.8 (CX-0387C-SC); CDX-0010C.HS.10 (CX-0387C-SC).

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 862-63.

i) (1h) repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 864. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

j) (1i) adapting the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 865-66.

Respondents contend that the DISH Set-Top Boxes and the Sling Fire App do not select or request by quality for the same reasons as argued regarding the '564 patent. *See* Resps. Br. at 101, 106. However, above I found that, with respect to the '564 patent, the DISH Set-Top Boxes and the Sling Fire App do shift the playback quality. *See supra* Sec. IX.B.1.j); CX-0010C (Negus DWS) at Q/A 865-66. Dr. Negus's analysis of the source code shows that the Sling Fire App and the Hopper 3 meet this limitation regardless of whether Media Segments were specified by a HLS, DASH, or a byte range. *See id.* at Q/A 865.

k) (1j) presenting the video for playback by providing the requested streamlets in order of ascending start time.

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation.

Respondents argue that use of the DISH Set-Top Boxes and the Sling Fire App does not meet this limitation for the same reasons as discussed above regarding the '564 patent. *See* Resps. Br. at 96. However, above I found that the conventional use of the DISH Set-Top Boxes and the Sling Fire App does indeed display the video to the user. *See supra* Sec. IX.B.1.k).

l) Technical Prong Conclusion

I find that each limitation of claim 1 of the '156 patent is met at least when DISH's customers use the DISH Set-Top Boxes and the Sling Fire App in their intended and authorized manner, and that DISH has satisfied the technical prong of the domestic industry requirement for claim 1 of the '156 patent.

2. Claim 4

a) The apparatus of claim 1, wherein the requesting the sequential streamlets comprises the apparatus transmitting hypertext transport protocol (HTTP) GET requests for selected streamlets, wherein each of the HTTP GET requests identifies the separate file stored by the video server that corresponds to the requested streamlet.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 1.

DISH has adduced evidence showing that the HLS Media Segments are each specified by a Uniform Resource Identifier unique to each Media Segment, and that these HLS Media Segments are each "separate files" retrieved by HTTP GET requests. *See* CX-0010C (Negus DWS) at Q/A 70. DASH Media Segments are likewise separate files obtained via HTTP GET requests. *See id.* Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the additional limitation of claim 4. *See* Resps. Br. at 94-108.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets claim 4 of the '156 patent. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 4.

XI. THE '554 PATENT

A. Infringement

DISH contends that iFit, Peloton, and MIRROR infringe independent claim 16 and dependent claims 17 and 20 of the '554 patent with accused products that implement the HLS Standard. *See* Compls. Br. at 82. The Staff agrees with DISH that respondents infringe claims 16, 17, and 20 under the adopted construction for the “quality” terms. *See* Staff Br. at 111-22.

1. Claim 16

a) (16pre) An end user station to stream a live event video over a network from a server for playback of the video, the content player device comprising:

Respondents argue that “the Accused Products do not meet the ‘live event’ limitations when streaming on-demand/pre-recorded content.” Resps. Br. at 79 (citing RX-0004C (Snoeren RWS) at Q/A 243-44). However, as I found above, the preamble of claim 16 is not limiting. *See supra* Sec. VII.B.5.a)(1). Respondents’ argument fails for at least that reason.

Even if the preamble were limiting, respondents’ accused products, with the exception of Peloton’s [REDACTED] and MIRROR’s MPEG-DASH system,²⁰ meet the preamble. *See* CX-0010C (Negus DWS) at Q/A 438-43. Respondents admit that “[u]sers who elect to become monthly subscribers (‘Peloton Members’) can receive access to and view ‘Live’ or ‘On Demand’ workout classes on a Peloton bike or treadmill,” and “the Live classes are released on a schedule made available to Peloton Members.” Resps. Br. at 7 (citing RX-0004C (Snoeren RWS) at Q/A

²⁰ All parties agree that the Peloton [REDACTED]. *See* Compls. Reply Br. at 24 n.11; Resps. Br. at 23-24. DISH does not accuse Peloton of infringing claims requiring “live” streaming via [REDACTED]. *See* Compls. Reply Br. at 24 n.11. Similarly, DISH does not contend that MIRROR’s MPEG-DASH system is used for live streaming. *See* Compls. Br. at 94.

56-57); *see also id.* at 12-14, 16 (MIRROR), 18-20 (iFIT). Hence, respondents admit that, except in the case of the Peloton [REDACTED] and the MIRROR MPEG-DASH product, the accused products are used to stream live classes. I find that the preamble of claim 16, if limiting, is met for all accused products except the Peloton [REDACTED] and the MIRROR MPEG-DASH.

b) (16a) a processor,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 444-47.

Respondents argue that "Dr. Negus's statement (and the record) is completely silent as to *how* (or even the fact that) the identified processor and memory for each of the Accused Products perform the required steps." Resps. Br. at 85 (citing RX-0004C (Snoeren RWS) Q/A 313-18) (emphasis in original). However, DISH has adduced evidence showing that the iFIT accused products have "a processor," the accused Peloton products have a "CPU" that is ">1.5Ghz," and the accused MIRROR products have a "Snapdragon 410 (APQ8016) Application Processor." *See* CX-0010C (Negus DWS) at Q/A 444, 448; JX-0080C (Brammer Dep.) at 68:2-21; CX-0472C (RFQ for Peloton Console) at PTON-ITC005760-63; RX-0070 (MIRROR Hardware Diagram).

Respondents' accused products thus satisfy this claim limitation.

c) (16b) a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 448.

DISH has adduced evidence showing that the iFIT accused products have "memory," "RAM" and "SD card" storage; the accused Peloton products have "RAM" of "2GB" and "NVRAM" of "16GB"; and the accused MIRROR products have an "LPDDR memory and eMMC

storage.” *See* CX-0010C (Negus DWS) at Q/A 444, 448; JX-0080C (Brammer Dep.) at 68:2-21; CX-0472C (RFQ for Peloton Console) at PTON-ITC005760-63; RX-0070 (MIRROR Hardware Diagram).

All of the accused products have executable applications, including the ExoPlayer, containing instructions executed by the processors within respondents’ accused products, and those instructions enable the features of the claimed invention as described with respect to each claim limitation below. *See* CX-0010C (Negus DWS) at Q/A 448; JX-0080C (Brammer Dep.) at 68:2-3, 68:8-21; CX-0472C (“Request for Quotation”) at 8; CX-0510 (Peloton User Manual); RX-0703C (“Compare Peloton Bike and Bike+”); CX-0183C (Peloton’s 8th Supp. Resps.); RX-0070 (MIRROR Hardware Diagram).

Respondents argue that DISH has failed to identify a processor that performs all of the steps recited in claim 16. *See* Resps. Br. at 85-86. Respondents point out that Dr. Negus cited to evidence identifying multiple processors in the accused products, thus demonstrating that DISH is relying on a plurality of processors to perform the claimed steps. *See id.*

DISH argues that there need not be a single identified processor that performs all of the recited claim steps in each instance because this argument contravenes the general rule that “the words ‘a’ or ‘an’ in a patent claim carry the meaning of ‘one or more.’” Compls. Br. at 84 (quoting *01 Communique Lab., Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1297 (Fed. Cir. 2012); CX-0010C (Negus DWS) at Q/A 446-47).

The Federal Circuit has “repeatedly emphasized that an indefinite article ‘a’ or ‘an’ in patent parlance carries the meaning of ‘one or more’ in open-ended claims containing the transitional phrase ‘comprising.’” *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000). The exceptions to this rule are “extremely limited: a patentee must ‘evinces [] a clear

intent’ to limit ‘a’ or ‘an’ to ‘one.’” *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008). Thus, absent a clear intent in the claims themselves, the specification, or the prosecution history, “a processor” is generally interpreted as “one or more processors.”

For example, in *Convolve, Inc. v. Compaq Computer Corp.*, the Federal Circuit considered whether a claim to “a processor” executing certain recited steps required all steps to be performed by a single processor. 812 F.3d 1313, 1320-22 (Feb. 10, 2016). The Federal Circuit explained that it has “repeatedly emphasized that an indefinite article ‘a’ or ‘an’ in patent parlance carries the meaning of ‘one or more’ in open-ended claims containing the transitional phrase ‘comprising.’” *Id.* at 1321(citations omitted). The court found the specification’s disclosure of an embodiment with more than one processor bolstered a conclusion that “a processor” should be construed as “one or more processors.” *Id.*

Here, the ’554 patent specification provides support that the steps of claim 16 may be performed by a plurality of processors. The specification recites:

Modules may also be implemented in software for execution by various types of **processors**. An identified module of executable code may, for instance, comprise one or more physical or logical blocks of computer instructions which may, for instance, be organized as an object, procedure, or function. Nevertheless, **the executables of an identified module need not be physically located together**, but may comprise disparate instructions stored in different locations which, when joined logically together, comprise the module and achieve the stated purpose for the module.

JX-0002 (’554 patent) at 5:41-50. The ’554 patent thus discloses that modules may be implemented in software for execution by various types of processors and that instructions in modules need not be physically located together, all of which suggests that more than one processor may be used in implementing the different modules. Moreover, respondents have cited

[REDACTED]

no evidence from the specification or the prosecution history to support their argument that a single processor must perform all the claimed steps. *See Convolv*, 812 F.3d at 1320.

Based on the foregoing, in view of the claim language and specification, “the processor” recited in claim 16 of the ’554 patent may refer to more than one processor.

Moreover, regardless of whether the claimed processor can be met by more than one processor, DISH’s expert Dr. Negus offered his expert opinion “that *the* processor in each of Respondents’ Accused Products satisfies this limitation.” CX-0010C (Negus DWS) at Q/A 448 (emphasis added). The only evidence respondents offered in their attempt to contradict that opinion was evidence related to the MIRROR accused products. *See* Resps. Br. at 85-86. Thus, Dr. Negus’ opinion is not specifically rebutted for the iFit and Peloton accused products.

With respect to the MIRROR accused products, respondents argue [REDACTED]

[REDACTED]

[REDACTED]

See Resps. Br. at 86. But evidence that the accused products have specialized subsidiary chips to assist in digital communication in no way contradicts Dr. Negus’ opinion. The main processor identified in each accused device still ultimately controls any subsidiary chips and executes instructions from memory that cause the claimed steps to be performed.

I find the accused products have a memory comprising non-transitory machine-readable instructions that, when executed, cause a single processor to perform the steps of the claim.

d) (16c) establish one or more network connections between the end user station and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 450-62. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.²¹

e) (16d) wherein the live event video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream, each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the live event video;

Respondents argue that "Claim 16 of the '554 Patent requires segmenting of videos *before* the individual segments are encoded." Resps. Br. at 77 (emphasis in original). However, no such requirement appears in the claim.

Respondents further argue that the prosecution history of a related application supports a requirement of segmenting a video before encoding segments. But the arguments made in that application were directed to claims that have elements not included in claim 16, such as "a "streamlet module ... to segment video ... to generate ... a plurality of sequential raw streamlets" and an "encoding module ... to encode each raw streamlet to generate ... a set including an encoded streamlet." RX-0004C (Snoeren RWS) at Q/A 186. The claims at issue here do not

²¹ Respondents dispute whether Peloton's [REDACTED] satisfies the "streamlets" limitation. *See* Resps. Br. at 86. DISH does not accuse Peloton's [REDACTED] of infringing the claims of the '554 patent. *See* Compls. Reply Br. at 24 n.11. Accordingly, respondents' argument is moot with respect to [REDACTED].

include a “streamlet module” or “raw streamlet.” The prosecution history cited by respondents does not limit the invention at issue in claim 16.

Respondents further argue that the accused products do not identify the video streams by their “quality.” *See* Resps. Br. at 85. However, respondents’ accused products each use three different Variant Streams encoded at three different respective bit rates using a common video codec. *See* CX-0010C (Negus DWS) at Q/A 467-68. As I found above, the terms “low quality stream,” “medium quality stream,” and “high quality stream” are construed to have their plain and ordinary meanings. *See supra* Sec. VII.B.3. I find the highest bitrate Variant Stream is a “high quality stream,” the lowest bitrate Variant Stream is a “low quality stream,” and a Variant Stream with an intermediate bitrate is a “medium quality stream.” CX-0010C (Negus DWS) at Q/A 467-68; *see also id.* at Q/A 473-79. Each Variant Stream in respondents’ accused products is defined by a Media Playlist and comprised of a sequence of Media Segments that constitute a “group of streamlets” for each respective variant. *Id.* at Q/A 467, 468. Additionally, each Variant Stream comprises at least two or more Media Segments. *Id.*; *see also id.* at Q/A 469-71; CX-0836 (RFC 8216).

Respondents contend that “bitrate” and “quality” are different terms and are presumed to have different meanings. *See* Resps. Br. at 80-81 (citing *CAE Screenplates Inc. v. Heinrich Fiedler GmbH & Co. KG*, 224 F.3d 1308, 1317 (Fed. Cir. 2000)). However, there is a known relationship between bitrate and quality. As Dr. Richardson testified, “[W]here the same source file is compressed with the same codec at different bitrates, higher bitrate tends to correspond to higher decoded image quality and lower bitrate tends to correspond to lower image quality.” RX-0001C (Richardson DWS) at Q/A 84; *see also id.* at Q/A 81, 353; *cf.* RX-0004C (Snoeren RWS) at Q/A 257. Indeed, at the evidentiary hearing, Dr. Richardson testified that bitrate and quality “are often

[REDACTED]

related, particularly if the encoding is the same, then as you increase the bitrate, you typically increase the quality.” Richardson Tr. 427–428. Dr. Negus testified that in his testing he observed both differing bitrates and differing quality among the relevant Variant Streams. CX-0010C (Negus DWS) at Q/A 473-79. Thus, even granting that the two terms have different meanings, the evidence shows both.

I thus find that the accused products satisfy this limitation.

f) (16e) wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 490-91. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

g) (16f) wherein the first streamlets of each of the low quality stream, the medium quality stream and the high quality stream each has an equal playback duration and each of the first streamlets encodes the same portion of the live event video at a different one of the different bitrates;

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 492-93. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

h) (16g) select a specific one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams,

Respondents’ accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 494-98.

Respondents contend that the accused products do not select or request by quality. *See* Resps. Br. at 85. However, above I found that each of respondents' accused products streams the video by selecting a specific stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams. *See supra* Sec. IX.A.1.h). Dr. Negus's analysis of the source code shows that ExoPlayer selects a specific one of the available HLS Variant Streams during live streaming based upon multiple determinations that each compare a factor relating to the performance of the network with certain thresholds in order to upshift ("select") a "higher quality one" of the variants ("higher ... bitrate version of the streams") when the factor is greater than a first threshold and in order to downshift ("select") a "lower quality one" of the variants ("lower bitrate version of the streams") when the factor is less than a second threshold." CX-0010C (Negus DWS) at Q/A 495.

i) (16h) place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 499-503. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

j) (16i) receive the requested first streamlet from the server via the one or more network connections; and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 504. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

k) (16j) provide the received first streamlet for playback of the live event video.

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 506-07. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

l) Infringement Conclusion

I find that respondents' accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, meet each limitation of claim 16 of the '554 patent, and therefore respondents infringe that claim.

2. Claim 17

a) The end user station of claim 16, wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the live event video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream.

As discussed above, the respondents' accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 16.

DISH has adduced evidence showing that each of the accused products satisfies the additional limitation of claim 17. *See* CX-0010C (Negus DWS) at Q/A 509-11. Respondents contend the accused products can be used with recorded content and therefore do not satisfy the "live event" requirement of claim 17. *See* Resps. Br. at 79. However, as I found above, the accused products can be and are used to stream live classes. *See supra* Sec. XI.A.1.a).

[REDACTED]

With the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, I find that respondents' accused products meet each limitation of claim 17, and therefore respondents infringe that claim.

3. Claim 20

a) The end user station of claim 16, wherein the first streamlets of the low quality stream, the medium quality stream, and the high quality stream are available before the live event is complete.

As discussed above, the respondents' accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 16.

DISH has adduced evidence showing that each of the accused products satisfies the additional limitation of claim 20. *See* CX-0010C (Negus DWS) at Q/A 513-20. Respondents contend the accused products can be used with recorded content and therefore do not satisfy the "live event" requirement of claim 20. *See* Resps. Br. at 79. However, above I found the accused products can be and are used to stream live classes. *See supra* Sec. XI.A.1.a).

With the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, I find that respondents' accused products meet each limitation of claim 20, and therefore respondents infringe that claim.

B. Domestic Industry (Technical Prong)

DISH contends that the DISH Set-Top Boxes and the Sling TV Apps practice independent claim 16 and dependent claim 17 of the '554 patent. *See* Compls. Br. at 139. Above I found that the Hopper 3 is representative of the DISH Set-Top Boxes after December 2017. *See supra* Sec. VIII.A. I also found, however, that DISH has not established that the Sling Fire App is representative of the Sling TV Apps. *See supra* Sec. VIII.B. The Staff argues that DISH has not

established that the DISH Set-Top Boxes and the Sling Fire App practice claim 16 of the '554 patent because these products lack a display. *See* Staff Br. at 149-57. The Staff further argues that DISH has not established that the Sling Fire App practices claim 16 because it lacks a processor and a memory. *See id.* at 157-60.

1. Claim 16

a) (16pre) An end user station to stream a live event video over a network from a server for playback of the video, the content player device comprising:

Respondents contend that DISH failed to show that the Sling Fire App and the Hopper 3 meet the “live event video” aspect of the preamble. *See* Resps. Br. at 101, 106. However, above I found the preamble of claim 16 is not limiting. *See supra* Sec. VII.B.5.a)(1). Respondents’ argument fails for at least that reason.

Even if the preamble were limiting, I find that use of the Sling Fire App and the Hopper 3 meet the “live event video” aspect of the preamble. Dr. Negus’s testing of the Sling Fire App and Hopper 3 involved streaming a “live” news or “live” sports program. *See* CX-0010C (Negus DWS) at Q/A 165-79. The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble. *See* CX-0010C (Negus DWS) at Q/A 771-72.

b) (16a) a processor,

There is no dispute that the DISH Set-Top Boxes comprise a processor. Respondents argue, however, that DISH failed to show that the Sling Fire App includes a processor. *See* Resps. Br. at 97. The Staff agrees that the Sling Fire App, which is a software application, does not include a processor. *See* Staff Br. at 157-58.

As discussed in detail *supra*, Sec. IX.B.1.k), “the technical prong of the domestic industry requirement may still be satisfied if it can be established that [the complainant] or its customers

configure the allegedly covered products in a manner that practices the claims within the United States.” *Certain Optoelectronic Devices, Components Thereof, and Prod. Containing Same*, Inv. No. 337-TA-669, ID at 101 (Mar. 12, 2010) (unreviewed).

Based on the evidence and arguments of the parties, I find that DISH established by a preponderance of the evidence that DISH’s customers use the invention of claim 16 of the ’554 patent when they use the Sling Fire App to stream videos onto their televisions, tablets, smart phones, and computers.

First, DISH presented evidence showing that DISH customers use the Sling Fire App with at least televisions, tablets, and computers. *See* CX-0010C (Negus DWS) at Q/A 669, 671, 684; CX-0002C (Kroonenberg DWS) at Q/A 55; CX-0445C (Sling TV Overview) at 2. All of those devices have processors that, when executing the instructions within the Sling Fire App, perform the steps recited in claim 16. Additionally, DISH adduced evidence of actual usage data, showing that Sling TV customers in fact use the Sling Fire App on devices with processors to view streaming content in the intended manner. *See* CX-0002C (Kroonenberg DWS) at Q/A 23; CX 0007C (Vander Veen DWS) at Q/A 31, 35; CX-0038C; CX-0039C; Mulhern Tr. 593-600; CX-0072C (2020 Market Data) at “Custom” Tab, Rows 78-84.

The Staff argues that DISH’s evidence is outdated because it relies on a teardown of an Amazon Fire product from 2014, while the ’554 patent did not issue until November 5, 2019. *See* Staff Br. at 157-58. However, the Staff does not contend that a more current Amazon Fire product would lack the claimed processor. *See id.* Indeed, as Dr. Richardson testified, a processor is a necessary component in any computing device, including the Amazon Fire. *See* RX-0001C (Richardson DWS) Q/A 216.

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 774-75.

c) (16b) a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 776-78.

There is no dispute that the DISH Set-Top Boxes contain a memory device. Respondents argue, however, that DISH failed to show that the Sling Fire App includes the claimed memory. *See* Resps. Br. at 98. The Staff agrees that the Sling Fire App, which is a software application, does not include a memory device. *See* Staff Br. at 158-60.

For similar reasons to those regarding the claimed “processor,” when a viewer uses the Sling Fire App on the Amazon Fire, the combination includes the claimed “digital processing apparatus memory device.” As noted above, the technical prong can be satisfied when customers configure a product in a manner that practices a patent claim within the United States. *Optoelectronic Devices*, Inv. No. 337-TA-669, ID at 101.

The Staff further argues that DISH’s evidence is outdated because it relies on a teardown of an Amazon Fire product from 2014, while the ’554 patent did not issue until November 5, 2019. *See* Staff Br. at 158-60. However, the Staff does not contend that a more current Amazon Fire would lack the claimed memory device. *See id.* Indeed, as Dr. Richardson testified, one of ordinary skill in the art would understand that a “computing environment,” such as the Amazon Fire, includes a “memory device.” *See* RX-0001C (Richardson DWS) Q/A 353, 379.

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 776-78.

d) (16c) establish one or more network connections between the end user station and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 779-84. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

e) (16d) wherein the live event video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream, each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the live event video;

Respondents argue that this limitation requires that the streamlets be first segmented and then encoded, and that DISH has failed to show this for either the Sling Fire App and the Hopper 3. *See* Resps. Br. at 101, 103. However, above I found that claim 16 does not require a video to be segmented before streamlets are encoded. *See supra* Sec. XI.A.1.e).

Respondents further argue that DISH has failed to show: (1) that the DISH Set-Top Boxes and the Sling Fire App identify a video stream by “quality” as opposed to some other characteristic, and (2) that the DISH Set-Top Boxes and the Sling Fire App have a “low quality stream.” *See* Resps. Br. at 102, 107. Respondents’ arguments refer back to arguments to the effect that respondents’ accused products do not meet this limitation. *See id.* The terms “low quality stream,” “medium quality stream,” and “high quality stream” are construed to have their plain and ordinary meanings. *See supra* Sec. VII.B.3. As I found above, respondents’ accused products do in fact identify a video stream by “quality.” *See supra* Sec. XI.A.1.h). Dr. Negus’s testing identified at least one of a “low quality stream,” at least one of a “medium quality stream,” and at least one of

[REDACTED]

a “high quality stream” when operating the Sling Fire App and the Hopper 3. *See* CX-0010C (Negus WS) at Q/A 787-91; CDX-0010C.TEST.162 (CX-0813); CDX-0010C.TEST.164 (CX-0814). Dr. Negus further confirmed this through source code analysis. *See* CX-0010C (Negus DWS) at Q/A 788-91.

Use of the DISH Set-Top Boxes and the Sling Fire App thus satisfies this limitation.

f) (16e) wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 794. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

g) (16f) wherein the first streamlets of each of the low quality stream, the medium quality stream and the high quality stream each has an equal playback duration and each of the first streamlets encodes the same portion of the live event video at a different one of the different bitrates;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 796-97.

Respondents contend that the DISH Set-Top Boxes and the Sling Fire App do not identify a stream for playback by “quality.” *See* Resps. Br. at 102, 107. However, I found above those DISH products in fact identify a stream for playback by “quality.” *See supra*, Sec. IX.B.1.j); see also CX-0010C (Negus DWS) at Q/A 796, 797. For the same reasons, I find use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation.

h) (16g) select a specific one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 799.

As with the previous limitation, respondents contend that the DISH Set-Top Boxes and the Sling Fire App do not identify a stream for playback by “quality.” *See* Resps. Br. at 102, 107. However, above I found that respondents’ accused products do in fact identify a video stream by “quality.” *See supra* Sec. XI.B.1.g). I find use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation.

i) (16h) place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 801. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

j) (16i) receive the requested first streamlet from the server via the one or more network connections; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 803. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

k) (16j) provide the received first streamlet for playback of the live event video.

Use of the DISH Set-Top Boxes and the Sling Fire App meet this limitation.

Respondents argue that use of the DISH Set-Top Boxes and the Sling Fire App does not meet this limitation for the same reasons as discussed above regarding the ’564 patent, namely,

[REDACTED]

that those products have no display for playback of a video. *See* Resps. Br. at 96-97. However, above I found that DISH customers in fact use the DISH Set-Top Boxes and the Sling Fire App with a display and the combination provides the received first streamlet for playback of the live event video. *See supra* Sec. IX.B.1.k). To the extent that this claim limitation requires a display, I find use of the DISH Set-Top Boxes and the Sling Fire App meet this limitation.

l) Technical Prong Conclusion

I find that each limitation of claim 16 is met at least when DISH's customers use the DISH Set-Top Boxes and the Sling Fire App in their intended and authorized manner, and that DISH has satisfied the technical prong of the domestic industry requirement for claim 16 of the '554 patent.

2. Claim 17

a) The end user station of claim 16, wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the live event video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 16.

Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the additional limitation of claim 17. *See* Resps. Br. at 94-108. DISH has adduced evidence showing that each of the DISH Set-Top Boxes and the Sling Fire App comprises a second streamlet of each of the groups of streamlets that each has the same second duration and corresponds to the same second portion of the live event video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream

having the same bitrate as the first streamlet of the low quality stream. *See* CX-0010C (Negus DWS) at Q/A 806.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets each limitation of claim 17. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 17.

XII. THE '555 PATENT

A. Infringement

DISH contends that iFit, Peloton, and MIRROR infringe independent claim 10 and dependent claims 11, 14, and 15 of the '555 patent with accused products that implement the HLS Standard (including Peloton's [REDACTED]) and MPEG-DASH. *See* Compls. Br. at 93. The Staff agrees with DISH that respondents infringe claims 10-11 and 14-15 under the adopted construction for the "quality" terms. *See* Staff Br. at 124-32.

1. Claim 10

a) (10pre) A content player device to stream a video over a network from a server for playback of the video, the content player device comprising:

Respondents contend the preamble of claim 10 of the '555 patent is limiting. *See* Resps. Br. at 52 n.15. The Staff agrees with respondents. *See* Staff Br. at 75-76. No party has explained why any limiting effect of the preamble is relevant to any issue I must decide in this investigation. To the extent such a determination is necessary, I find that the preamble of claim 10 is limiting as it provides antecedent basis for the terms "the content player device," "the video," and "the server." *See Bio-Rad Labs., Inc. v. 10X Genomics Inc.*, 967 F.3d 1353, 1371 (Fed. Cir. 2020).

[REDACTED]

In any event, respondents' accused products satisfy this preamble. *See* CX-0010C (Negus DWS) at Q/A 542-44. Respondents do not contest that the accused products satisfy the preamble. *See* Resps. Br. at 86-88.

b) (10a) a processor,

Respondents contend that the accused products do not have a processor for the same reasons argued above regarding limitations 16a and 16b of the '554 patent. *See* Resps. Br. at 87. However, above I found that the accused products do include the claimed processor. *See supra* Secs. XI.A.1.b) and c); CX-0010C (Negus DWS) at Q/A 546.

c) (10b) a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

As with the previous limitation, respondents argue that the accused products do not include the claimed processor for the same reasons argued above with respect to limitations 16a and 16b of the '554 patent. *See* Resps. Br. at 87. However, as I found above, the accused products do include the claimed processor. *See supra* Secs. XI.A.1.b) and c); CX-0010C (Negus DWS) at Q/A 546-547. Respondents' accused products meet this limitation.

d) (10c) establish one or more network connections between the client module and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 548-64.

Respondents only contest this limitation with respect to Peloton's [REDACTED], arguing that product does not have streamlets as claimed. *See* Resps. Br. at 87. However, Peloton's

[REDACTED]

[REDACTED]

[REDACTED]. See CX-0010 (Negus DWS) at Q/A 556-57. While [REDACTED]

[REDACTED] CX-0010C (Negus DWS) at Q/A 559; JX-0076C (Shanahan Dep.) 215:25-216:20. The term “streamlet(s)” is construed to mean “any sized portion(s) of the content file.” See *supra* VII.B.1. I find that the segments [REDACTED] [REDACTED] are streamlets. Other than the differences between [REDACTED], the rest of [REDACTED] “is the same” as the Peloton systems that use HLS. JX-0076C (Shanahan Dep.) 215:25-216:20; CX-0010C (Negus WS) at Q/A 556-63.

e) (10d) wherein the video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream, wherein each of the low quality stream, the medium quality stream, and the high quality stream comprises a streamlet that encodes the same portion of the video at a different one of the plurality of different bitrates;

Respondents’ accused products meet this limitation. See CX-0010C (Negus DWS) at Q/A 565-75. Respondents contend that this limitation is not met for the same reasons as argued above regarding limitation 16d of the ’554 patent. See Resps. Br. at 86-87. However, above I found that respondents’ accused products satisfy the corresponding claim limitation of the ’554 patent. See *supra* Sec. XI.A.1.e).

f) (10e) wherein at least one of the low quality stream, medium quality stream, and high quality stream is encoded at a bit rate of no less than 600 kbps; and

Respondents’ accused products meet this limitation. See CX-0010C (Negus DWS) at Q/A 576. Respondents do not contest that the accused products satisfy this limitation. See Resps. Br. at 86-88.

g) (10f) wherein the streamlet encoding the same portion of the video in the low quality stream has an equal playback duration as the streamlet encoding the same portion of the video in the high quality stream;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 577-78. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 86-88.

h) (10g) select a specific one of the streams based upon a determination by the client module to select a higher or lower bitrate version of the streams,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 579. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 86-88.

i) (10h) place a streamlet request to the server over the one or more network connections for the selected stream;

Respondents argue that this limitation "requires making a request and receiving 'requested streamlets' and thus requires placing *one* request for *multiple* files." Resps. Br. at 87 (emphasis in original). However, nothing in the plain language of this limitation requires a single request to be a request for multiple streamlets. *See supra* Sec. VII.B.2; Sec. X.A.1.g). I found above that respondents' accused products place a streamlet request to the server over the one or more network connections for the selected stream. *See supra* Sec. X.A.1.g). I therefore find respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 580-82.

j) (10i) receive the requested streamlets from the server via the one or more network connections; and

As with the limitation above, respondents argue that this limitation receiving multiple streamlets from a single request. However, nothing in the plain language of this limitation requires a single request to be a request for multiple files. *See supra* Sec. VII.B.2; Sec. X.A.1.g). I found

above that respondents' accused products receive streamlets from the server via the one or more network connections. *See supra* Sec. IX.A.1.c). I therefore find respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 583-84.

k) (10j) provide the received streamlets for playback of the video.

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 585. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 86-88.

l) Infringement Conclusion

I find that respondents' accused products meet each limitation of claim 10 of the '555 patent, and therefore respondents infringe that claim.

2. Claim 11

a) The content player device of claim 10 wherein each streamlet of the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream has a duration that is the same as each other.

As discussed above, the respondents' accused products satisfy all limitations of independent claim 10.

DISH has adduced evidence showing that each of the accused products comprises a media player configured to generate the factor according to the responses to segment requests. *See* CX-0010C (Negus DWS) at Q/A 588-89. Respondents do not contest that the accused products satisfy the additional limitation of claim 11. *See* Resps. Br. at 86-88.

I find that respondents' accused products meet the additional limitation of claim 11, and therefore respondents infringe that claim.

3. Claim 14

a) The content player device of claim 10, wherein the video is a video of a live event.

As discussed above, the respondents' accused products satisfy all limitations of independent claim 10.

DISH has adduced evidence showing that each of the accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system,²² satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 590-91. Respondents argue that the accused products "do not infringe claims 14 and 15 of the '555 patent for the same reasons that Respondents do not infringe claims 16, 17, and 20 of the '554 patent," namely, because the accused products are used to stream recorded events. Resps. Br. at 87. However, respondents admit that "[u]sers who elect to become monthly subscribers ('Peloton Members') can receive access to and view 'Live' or 'On Demand' workout classes on a Peloton bike or treadmill," and "the Live classes are released on a schedule made available to Peloton Members." Resps. Br. at 7 (citing RX-0004C (Snoeren RWS) at Q/A 56-57); *see also* 12-14, 16 (MIRROR), 18-20 (iFIT). Hence, respondents admit that, except in the case of the Peloton [REDACTED] and the MIRROR MPEG DASH product, the accused products are used to stream live classes.

I find that claim 14 is met for all accused products except the Peloton [REDACTED] and the MIRROR MPEG-DASH. I therefore find respondents infringe claim 14.

²² All parties agree that the Peloton [REDACTED]. *See* Compls. Reply Br. at 24 n.11; Resps. Br. at 23-24. DISH does not accuse Peloton of infringing claims requiring "live" streaming via the Peloton [REDACTED]. *See* Compls. Reply Br. at 24 n.11. Similarly, DISH does not contend that MIRROR's MPEG-DASH system is used for live streaming. *See* Compls. Br. at 94.

4. Claim 15

a) The content player device of claim 14, wherein the streamlets of the low quality stream, the medium quality stream, and the high quality stream are available before the live event is complete.

As discussed above, the respondents' accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 14.

DISH has adduced evidence showing that each of the accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 592-93. Respondents argue that the accused products "do not infringe claims 14 and 15 of the '555 patent for the same reasons that Respondents do not infringe claims 16, 17, and 20 of the '554 patent," namely, that the accused products are used to stream recorded events. *Resps. Br.* at 87. However, above I found that, except in the case of the Peloton [REDACTED] and the MIRROR MPEG-DASH product, the accused products are used to stream live classes. *See supra* Sec. XI.A.1.a).

With the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system, I find that respondents' accused products meet each limitation of claim 15, and therefore respondents infringe that claim.

B. Domestic Industry (Technical Prong)

DISH contends that the DISH Set-Top Boxes and the Sling TV Apps practice independent claim 10 and dependent claims 11 and 14 of the '555 patent. *See Compls. Br.* at 151. Above I found that the Hopper 3 is representative of all DISH Set-Top Boxes after December 2017. *See supra* Sec. VIII.A. I also found, however, that DISH has not established that the Sling Fire App is representative of the Sling TV Apps. *See supra* Sec. VIII.B. The Staff argues that DISH has

not established that the DISH Set-Top Boxes and the Sling Fire App practice claim 10 of the '555 patent because these products lack a display. *See* Staff Br. at 149-57. As discussed further below, the Staff further argues that DISH has not established that the Sling Fire App practices claim 10 because it lacks a processor and a memory. *See id.* at 157-60.

1. Claim 10

a) (10pre) A content player device to stream a video over a network from a server for playback of the video, the content player device comprising:

Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble. *See* Resps. Br. at 94-108. To the extent the preamble of claim 10 is limiting, I find that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble. *See* CX-0010C (Negus DWS) Q/A 824.

b) (10a) a processor,

There is no dispute that the DISH Set-Top Boxes comprise a processor. Respondents argue, however, that DISH failed to show that the Sling Fire App includes a processor. *See* Resps. Br. at 98. The Staff agrees that the Sling Fire App, which is a software application, does not include a processor. *See* Staff Br. at 157-58.

As discussed in detail *supra*, Sec. IX.B.1.k), “the technical prong of the domestic industry requirement may still be satisfied if it can be established that [the complainant] or its customers configure the allegedly covered products in a manner that practices the claims within the United States.” *Certain Optoelectronic Devices, Components Thereof, and Prod. Containing Same*, Inv. No. 337-TA-669, ID at 101 (Mar. 12, 2010) (unreviewed).

Based on the evidence and arguments of the parties, I find that DISH established by a preponderance of the evidence that DISH’s customers use the invention of claim 10 of the '555

patent when they use the Sling Fire App to stream videos onto their televisions, tablets, smart phones, and computers. As I found above, DISH adduced evidence showing that DISH customers use the Sling Fire App with compatible devices that include processors configured to execute instructions corresponding to the steps recited in claim 10. *See supra* XI.B.1.b) (citing CX-0010C (Negus DWS) at Q/A 669, 671, 684; CX-0002C (Kroonenberg DWS) at Q/A 55; CX-0445C (Sling TV Overview) at 2). Moreover, DISH adduced evidence of actual usage data demonstrating that Sling TV customers in fact use the Sling Fire App on devices with processors. *See id.* (citing CX-0002C (Kroonenberg DWS) at Q/A 23; CX 0007C (Vander Veen DWS) at Q/A 31, 35; CX-0038C; CX-0039C; Mulhern Tr. 593-600; CX-0072C (2020 Market Data) at “Custom” Tab, Rows 78-84).

The Staff argues that DISH’s evidence is outdated because it relies on a teardown from 2014, while the ’555 patent did not issue until November 5, 2019. *See* Staff Br. at 157-58. However, the Staff does not contend that a more current Amazon Fire would lack the claimed processor. *See id.* Indeed, as Dr. Richardson testified, a processor is a necessary component in any computing device, including the Amazon Fire. *See* RX-0001C (Richardson DWS) at Q/A 216.

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 825.

c) (10b) a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 776-78.

There is no dispute that the DISH Set-Top Boxes contain a memory device. Respondents argue, however, that DISH failed to show that the Sling Fire App includes the claimed memory. *See* Resps. Br. at 98. The Staff agrees that the Sling Fire App, which is a software application, does not include a memory device. *See* Staff Br. at 158-60.

For similar reasons to those regarding the claimed “processor,” when a viewer uses the Sling Fire App on the Amazon Fire, the combination includes the claimed “digital processing apparatus memory device.” As noted above, the technical prong can be satisfied when customers configure a product in a manner that practices a patent claim within the United States. *Optoelectronic Devices*, Inv. No. 337-TA-669, ID at 101.

The Staff further argues that DISH’s evidence is outdated because it relies on a teardown from 2014, while the ’555 patent did not issue until November 5, 2019. *See* Staff Br. at 158-60. However, the Staff does not contend that a more current Amazon Fire would lack the claimed memory device. *See id.* Indeed, as Dr. Richardson testified, one of ordinary skill in the art would understand that a “computing environment,” such as the Amazon Fire, includes a “memory device.” *See* RX-0001C (Richardson DWS) at Q/A 353, 379.

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 826.

d) (10c) establish one or more network connections between the client module and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 827-29. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

e) (10d) wherein the video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream, wherein each of the low quality stream, the medium quality stream, and the high quality stream comprises a streamlet that encodes the same portion of the video at a different one of the plurality of different bitrates;

Respondents argue that this limitation requires that the streamlets be first segmented and then encoded, and that DISH has failed to show this for either the Sling Fire App or the Hopper 3. *See Resps. Br. at 103, 107.* However, above I found that claim 10 does not require a video to be segmented before streamlets are encoded. *See supra* Sec. XII.A.1.e).

Respondents further argue that DISH has failed to show that the DISH Set-Top Boxes and the Sling Fire App have a “low quality stream” for the same reasons that respondents’ accused products do not meet this limitation. *See Resps. Br. at 105, 108.* The terms “low quality stream,” “medium quality stream,” and “high quality stream” are construed to have their plain and ordinary meanings. *See supra* Sec. VII.B.3. As I found above, respondents’ accused products do in fact identify a video stream by “quality.” *See supra* Sec. XI.A.1.h). Dr. Negus’s testing identified at least one of a “low quality stream,” at least one of a “medium quality stream,” and at least one of a “high quality stream” when operating the Sling Fire App and the Hopper 3. *See CX-0010C (Negus WS) at Q/A 787-91, 831; CDX-0010C.TEST.162 (CX-0813); CDX-0010C.TEST.164 (CX-0814).* Dr. Negus further confirmed this through source code analysis. *See CX-0010C (Negus DWS) at Q/A 788-91, 831.*

Use of the DISH Set-Top Boxes and the Sling Fire App thus satisfies this limitation.

f) (10e) wherein at least one of the low quality stream, medium quality stream, and high quality stream is encoded at a bit rate of no less than 600 kbps; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 833. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

g) (10f) wherein the streamlet encoding the same portion of the video in the low quality stream has an equal playback duration as the streamlet encoding the same portion of the video in the high quality stream;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 835. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

h) (10g) select a specific one of the streams based upon a determination by the client module to select a higher or lower bitrate version of the streams,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 837-38. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

i) (10h) place a streamlet request to the server over the one or more network connections for the selected stream;

As an initial matter, the term “place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections” is construed to have its plain and ordinary meaning (*e.g.*, request a plurality of streamlets over the one or more network connections for the selected stream; and receive the requested streamlets from the server via the one or more network connections).” *See supra* Sec. VII.B.2.

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 839-40. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

j) (10i) receive the requested streamlets from the server via the one or more network connections; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 841-42. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

k) (10j) provide the received streamlets for playback of the video.

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation.

Respondents argue that use of the DISH Set-Top Boxes and the Sling Fire App does not meet this limitation for the same reasons as discussed above regarding the '564 patent, namely, that those products have no display for playback of a video. *See* Resps. Br. at 97. However, above I found that DISH customers in fact use the DISH Set-Top Boxes and the Sling Fire App with a display and the combination provides the received streamlets for playback of the video. *See supra* Sec. IX.B.1.k). To the extent that this claim limitation requires a display, I find use of the DISH Set-Top Boxes and the Sling Fire App meet this limitation.

l) Technical Prong Conclusion

I find that each limitation of claim 10 is met at least when DISH's customers use the DISH Set-Top Boxes and the Sling Fire App in their intended and authorized manner, and that DISH has satisfied the technical prong of the domestic industry requirement for claim 10 of the '555 patent.

2. Claim 11

a) The content player device of claim 10 wherein each streamlet of the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream has a duration that is the same as each other.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 10.

DISH has adduced evidence showing that each streamlet of the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream has a duration that is the same as each other. *See* CX-0010C (Negus DWS) at Q/A 846-47. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets each limitation of claim 11. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 11.

3. Claim 14

a) The content player device of claim 10, wherein the video is a video of a live event.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 10.

DISH has adduced evidence showing the streaming of a live event video. *See* CX-0010C (Negus DWS) at Q/A 849. Respondents argue that DISH failed to show that use of the Sling Fire App and the Hopper 3 meets the “live event video” limitation for the same reasons as argued regarding the respondents’ accused products. *See* Resps. Br. at 103, 108. However, above I found

[REDACTED]

that respondents’ accused products meet the “live event video” limitation. *See supra* Sec. XI.A.1.a).

The record evidence further demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 849. Dr. Negus’s testing of the Sling Fire App and Hopper 3 involved streaming a “live” news or “live” sports program. *See id.*

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets each limitation of claim 14. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 14.

XIII. INDIRECT INFRINGEMENT

DISH contends that respondents have induced their customers to infringe the asserted patents. *See* Compls. Br. at 115-16. For induced infringement, the complainant must show that the defendant knew of the patent and that the induced acts constituted patent infringement. *Commil USA, LLC v. Cisco Sys., Inc.*, 575 U.S. 632, 638-39 (2015). Induced infringement requires a finding that the infringer possessed a specific intent to encourage another’s infringement. *i4i Ltd. Partnership v. Microsoft Corp.*, 598 F.3d 831, 851 (Fed. Cir. 2010), *aff’d*, 564 U.S. 91 (2011).

A. Knowledge of the Patent

DISH contends that respondents have each had knowledge of the asserted patents “[s]ince the May 13, 2021 institution of this Investigation.” Compls. Br. at 115. The Commission has held that service of a section 337 complaint is sufficient to satisfy the knowledge requirement for indirect infringement after the date of service. *Certain Beverage Brewing Capsules, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-929, Comm’n Op. at 19 (Apr. 5, 2016). Respondents do not contest that they were served with the complaint. *See* Resps. Br. at

87. The record shows that respondents continued to infringe after obtaining knowledge of the asserted patents. *See* Peloton Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 758953; iFIT Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 758184; and MIRROR Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 756162; CX-0098C (Peloton Sales).

B. Inducement

Respondents argue that DISH has not offered any evidence to support its induced infringement claim. *See id.* However, DISH adduced evidence showing that respondents induced their customers' direct infringement by supplying them with the accused products and instructing them to use the accused products in an infringing manner. CX-0501 (NordicTrack Manual instructing users to stream videos on the device) at 24; CX-0839 (NordicTrack Manual instructing users to stream videos on the device) at 23-24; CX-0510 (Peloton Bike User Manual instructing users to stream videos on the device) at 15; RX-0094 (Peloton Product Manuals instructing users to stream videos on the device) at 16; RX-0050 (MIRROR webpage instructing users to stream videos on the device); RX-0040 (MIRROR webpage instructing users to stream videos on the device) at 5. DISH further adduced evidence showing that respondents induced infringement by soliciting customers, encouraging and guiding their infringing use, and servicing the infringing products for customers. RX-0684 (MIRROR webpage listing device for sale and offering "unlimited live and on-demand workouts risk-free for 30 days") at 31; RX-0033 (iFit webpage offering "Free Trial" and for customers to "Use our equipment") at 10; RX-0664 (noting "iFit's commitment to delivering personalized connected health and fitness experiences to its growing community"); RX-0703 ("Compare the Peloton Bike and Bike+"); RX-0077 (Peloton Financing Plans for Customers); RX-0078 (Peloton Story) ("Our library of classes ... keep[s] you coming

back”); RX-0095 (Peloton Membership); RX-0096 (Shop the Original Peloton Bike) (“All-Access Membership is required with all Bike packages”).

Respondents further argue that there can be no liability for indirect infringement because DISH has failed to prove direct infringement. Resps. Br. at 88. However, as determined above, respondents’ accused products infringe asserted claims of each of the asserted patents. *See supra* Secs. IX.A, X.A, XI.A, XII.A. In view of the evidence presented by DISH, coupled with evidence of ongoing sales of the accused products post-dating service of the complaint,²³ DISH has met its burden of showing that respondents induced infringement of the asserted claims.

XIV. VALIDITY

A. Priority Date

Respondents argue that claims 16, 17 and 20 of the ’554 patent and claims 14 and 15 of the ’555 patent cannot claim priority to the April 30, 2004, filing date of U.S. Application No. 60/566,831 (“the ’831 Application”) because the “live event” aspect of the invention in those claims is not sufficiently described and enabled in the ’831 Application. *See* Resps. Br. at 108. DISH contends that the ’831 Application describes and enables the asserted claims. *See* Compls. Br. at 167-70.

The ’831 Application is the provisional application to which all the asserted patents claim priority. *See supra* Sec. I.D. While respondents concede that the ’831 Application refers to “live” video, they nevertheless argue that “there is no description of how live video transfer could be

²³ *See* Peloton Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 758953; iFIT Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 758184; and MIRROR Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 756162; CX-0098C (Peloton Sales).

done using the system described in the specification such that a [person of ordinary skill in the art] would understand the inventors to actually possess the invention.” Resps. Br. at 108.

The ’831 Application recites:

[0007] In the depicted embodiment, the system 100 also includes a publisher 110, and a web server 116. The publisher 110 may be a creator or distributor of content. For example, if the content to be streamed were a broadcast of a television program, the publisher may be a television or cable network channel such as NBC®, or MTV®. Content may be transferred over the internet 106 to the content server 102, where the content is received by a content module 112. The content module 112 may be configured to receive, process, and store content. In one embodiment, processed content is accessed by a client module 114 configured to play the content on the end user station 104. In a further embodiment, the client module 114 is configured to receive different portions of a content stream from a plurality of locations simultaneously. For example, the client module 114 may request and receive content from any of the plurality of web servers 116.

[0008] Figure 2a is a schematic block diagram graphically illustrating one embodiment of a content file 200. In one embodiment, the content file 200 is distributed by the publisher 110. **The content file 200 may comprise a television broadcast, sports event, movie, music, concert, etc. The content file 200 may also be live or archived content.** The content file 200 may comprise uncompressed video and audio, or alternatively, video or audio. Additionally, the content file 200 may be compressed. Examples of a compressed content file 200 include, but are not limited to, DivX®, Windows Media Video 9®, Quicktime 6.5 Sorenson 3®, or Quicktime 6.5/MPEG-4® encoded content.

JX-0029 (’831 Application), ¶¶ [0007-08] (emphasis added). As shown in the above-recited paragraphs, the ’831 Application expressly discloses that the “content file 200” may be a “live” event. The ’831 Application further describes methods of streaming content in more detail:

[0026] Figure 5 is a schematic flow chart diagram illustrating one embodiment of a method 500 for processing content in accordance with the present invention. In one embodiment the method 500 starts 502, and the content module 112 receives 504 content from the publisher 110. Receiving content 504 may comprise receiving 504 a digital copy of the content file 200, or digitizing a physical copy of the content file 200. Alternatively, **receiving 504 content may comprise capturing a radio or television broadcast.** Once received 504, the stream module 302 generates 506 a plurality of streams 202, each stream 202 having a different quality. The quality may be predefined, or automatically set according to end user bandwidth, or in response to pre-designated publisher guidelines

[0027] The streamlet module 304 receives the streams 202 and generates 508 a plurality of streamlets 212. In one embodiment, **generating 508 streamlets comprises dividing the stream 202 into a plurality of two second streamlets 212.** Alternatively, the streamlets may have any length less than or equal to the length of the stream 202. **The encoder module 306 then encodes 510 the streamlets according to a compression algorithm.** In a further embodiment, the algorithm comprises a proprietary codec such as WMV9®. The encoder module 306 then stores 512 the encoded streamlets in the streamlet database 308. Once stored 512, the web server 116 may then serve 514 the streamlets. In one embodiment, serving 514 the streamlets comprises receiving streamlet requests from the client module 114, retrieving the requested streamlet from the streamlet database 308, and subsequently transmitting the streamlet to the client module 114. The method 500 then ends 516.

Id., ¶¶ [0026-27] (emphasis added). As can be seen, the '831 Application teaches that live video streaming may be performed by dividing a content stream into streamlets, for example streamlets of two seconds in length, and then encoding the streamlets at multiple bitrates. *See id.*, ¶ [0027]. A person of skill in the art would understand from these teachings how to make a stream of a live event available to a viewer before the live event is complete. *See CX-0008C (Jeffay RWS) Q/A 36.*

Respondents argue that “all the disclosure of how ‘live’ video could be handled was added in a continuation-in-part application [U.S. Pat. Application No. 11/673,483], filed February 9, 2007.” Resps. Br. at 109 (citing RX-0001C (Richardson DWS) at Q/A 77). However, as explained above, the '831 Application teaches the creation and encoding of two-second streamlets that enable and describe the claimed subject matter. As Dr. Jeffay testified, the additional disclosure in CIP specification relates to specific improvements that use two-pass or multi-pass encoding with parallel encoders. *See CX-0008C (Jeffay RWS) at Q/A 35.*

Respondents have failed to show by clear and convincing evidence that the asserted “live event” claims are not entitled to the priority date of the ’831 Application.²⁴

B. Validity Under 35 U.S.C. §§ 102 and 103

1. Anticipation – Carmel

Respondents contend that U.S. Patent No. 6,389,473 to Carmel anticipates each of the asserted claims. *See* Resps. Br. at 114-55. Carmel was filed on March 24, 1999, and therefore qualifies as prior art to the asserted patents. *See* RX-0221 (Carmel). The Staff agrees with respondents that Carmel anticipates each asserted claim. *See* Staff Br. at 170-90. For the reasons below, I find that respondents have not shown by clear and convincing evidence that Carmel anticipates any of the asserted claims because each independent claim requires a “request” that Carmel does not disclose.

a) Request Limitations – ’564 Patent Limitation 1g; ’156 Patent Limitation 1f; ’554 Patent Limitations 16h-16i; ’555 Patent Limitations 10h-10i

Respondents have not shown by clear and convincing evidence that Carmel discloses the “request” limitations of the asserted claims.

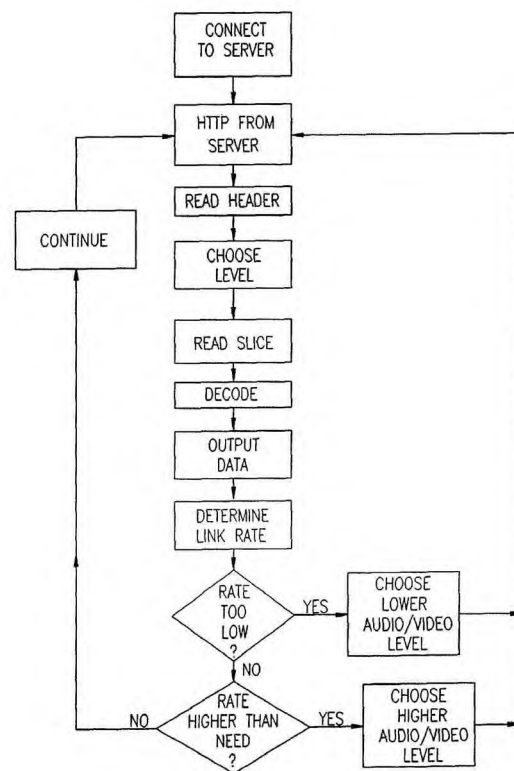
(1) ’564 Patent Limitation 1g

Claim 1 of the ’564 patent recites, in part, “automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback

²⁴ Respondents further contend that DISH’s position on priority is incompatible with DISH’s position on inventorship. *See* Resps. Br. at 109. That argument will be addressed with respondents’ inventorship challenge. *See* *infra* Sec. XIV.D.

quality to a higher or lower quality one of the different copies.” JX-0001 (’564 patent) at claim 1 (referred to above as limitation 1g of the ’564 patent).

Regarding this limitation of claim 1, respondents argue that Carmel’s Figure 6B illustrates automatic, repeated requests by a client for slices of video content. *See* Resps. Br. at 129 (citing RX-0001C (Richardson DWS) at Q/A 192-93). Respondents also contend that in columns 10 and 11 Carmel discloses a client 30 “periodically assessing data transfer rate and requesting portions (slices) from one of a plurality of copies (quality levels).” *Id.* (citing RX-0221 (Carmel) at 10:36-54, 11:9-22). Figure 6B of Carmel is reproduced below:



RX-0221 (Carmel) at. Fig. 6B.

Regarding Figure 6B, Carmel recites:

FIG. 6B is a flow chart illustrating the operation of clients 30 in downloading and playing back multi-level data stream 41 (FIG. 3D) transmitted

from server 36, in accordance with another preferred embodiment of the present invention. As in the method of FIG. 6A, each client 30 connects to the server, generally using a single HTTP link. After reading header 43 and, preferably, making an initial assessment of the link bandwidth, **the client selects one of the available quality levels in the stream.** Responsive to the selection, **server 36 begins to transmit data slices at the chosen quality level.** The slices are received, decoded and output by the client.

Periodically, **client 30** makes an assessment of the rate of data transfer over the link from the server and, if necessary, **changes the quality level** accordingly.

Id. at. 10:64-11:11 (emphasis added).

As can be seen above, Carmel discloses that the client “selects one of the available quality levels”; Carmel does not disclose a client “requesting portions (slices) from one of a plurality of copies (quality levels)” as respondents contend. *Compare id. with* Resps. Br. at 129. More importantly, Carmel does not disclose a request for “one of the files” or streamlets on the server, as limitation 1g requires. *See, e.g.,* RX-0221 (Carmel) at 9:6-10, 10:64-11:22, Fig. 6B. As respondents’ expert Dr. Richardson was forced to concede upon cross-examination, merely selecting “one of the available quality levels,” as Carmel discloses, is not a request for a specific file. Richardson Tr. 385-386. DISH’s expert Dr. Jeffay confirmed that the client in Carmel is limited to selecting a quality level rather than requesting individual files. *See* CX-0008C (Jeffay RWS) at Q/A 111.

Respondents further argue that Carmel describes client 30 using HTTP to download the video sequence, which “typically” entails requesting data located at a Uniform Resource Locator. *See* Resps. Br. at 129-30 (citing RX-0001C (Richardson DWS) at Q/A 192-93). However, Dr. Jeffay testified that Carmel’s system could be implemented using HTTP “chunked transfer encoding” by pushing the slices to the client without the client requesting individual portions or slices of the video. Jeffay Tr. 639–640; CX-0008C (Jeffay RWS) at Q/A 111. In any event,

anticipation requires every limitation is “‘necessarily present,’ not merely probably or possibly present, in the prior art.” *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002). It requires “strict identity.” *Id.* That standard is not met by hypothesizing that HTTP would “typically” be used to send a request for a file in Carmel. Also, Carmel itself gives reason to doubt Dr. Richardson’s hypothesis that a client could request a file from a server. Figure 6B of Carmel recites “HTTP **FROM** SERVER.” RX-0221 (Carmel) at. Fig. 6B (emphasis added). Nothing in the decision flow in Figure 6B shows a request from the client **to** the server.

Respondents further argue that claims 11 and 12 of Carmel disclose a request for a file. *See* Resps. Br. at 130. As an initial matter, claim 12 depends on claim 11, which depends on claim 2, which depends on claim 1. The relevant claims read:

1. A method for real-time broadcasting from a transmitting computer to one or more client computers over a network, comprising:

providing at the transmitting computer a data stream having a given data rate;

dividing the stream into a sequence of slices, each slice having a predetermined data size associated therewith;

encoding the slices in a corresponding sequence of files, each file having a respective index; and

uploading the sequence to a server at an upload rate generally equal to the data rate of the stream, such that the one or more client computers can download the sequence over the network from the server at a download rate generally equal to the data rate.

2. A method according to claim 1, and comprising downloading the sequence using an Internet protocol over the network from the server to the one or more client computers.

11. A method according to claim 2, wherein encoding the slices comprises encoding slices at a plurality of different quality levels, such that the files corresponding to a given one of the slices have a different, respective data size for each of the quality levels.

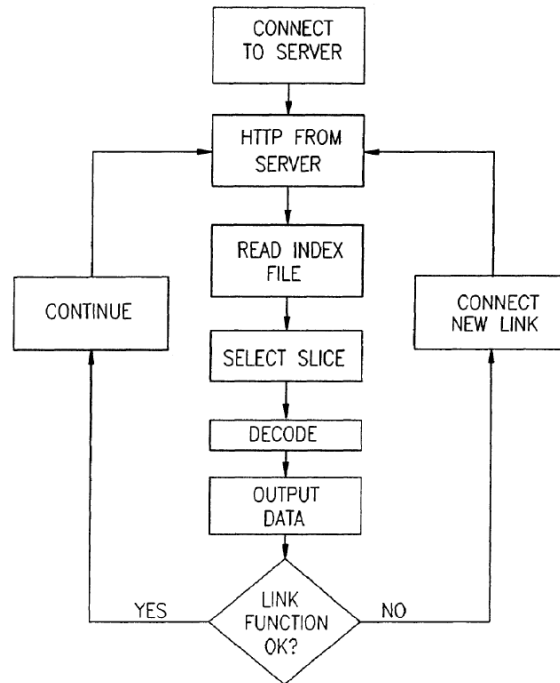
12. A method according to claim 11, wherein downloading the sequence comprises determining a data bandwidth of the network between the server and the client computer and selecting one of the quality levels responsive to the determined bandwidth.

As can be seen, claims 1, 2, 11, and 12 do not disclose that the client requests a specific file. Claim 1 recites that the transmitting computer “upload[s] the sequence to a server at an upload rate generally equal to the data rate of the stream,” and the “one or more client computers can download the sequence over the network from the server at a download rate generally equal to the data rate.” On its face, claim 1 does not disclose more than the general concept of dividing the stream into a sequence of slices to be stored on a server for the client to download.

Claim 2 of Carmel, which depends on claim 1, discloses using an Internet protocol for downloading the sequence of slices, but does not disclose any request from the client to the server for a particular file. Claim 11, dependent on claim 2, discloses encoding the slices at a plurality of different quality levels, producing a separate encoded file corresponding to each encoded slice, and uploading the files to the server. Claim 12 depends on claim 11, and recites, in part, “wherein downloading the sequence comprises determining a data bandwidth of the network between the server and the client computer and **selecting one of the quality levels** responsive to the determined bandwidth.” *Id.* at claim 12 (emphasis added). Thus, consistent with Carmel’s disclosure regarding Figure 6B, Carmel’s method of claim 12 clearly differs from the system of claim 1 of the ’564 patent, where the client “request[s] for each such portion one of the files from one of the copies” stored on the server rather than merely “select[s] one of the quality levels.”

The Staff agrees with respondents that Carmel invalidates the asserted claims, and argues that Carmel’s Figure 6B discloses this element, relying in part on disclosure in Carmel regarding Figure 6A. *See* Staff Br. at 177-79.

The dispute here centers on whether or not Carmel discloses combining Figure 6A with Figure 6B. As shown below, Figure 6A discloses that the client selects an appropriate starting slice after reading the index file:



RX-0221 (Carmel) at Fig. 6A. Regarding Figure 6A, Carmel recites:

Each client 30 connects to server 36, optionally using multiple HTTP links, in a manner similar to that shown and described above with reference to FIG. 4. Typically, client 30 opens one or two HTTP links, over which files 42, 44, 46, etc., are downloaded in successive alternation, but as in the case of transmitting computer 34, a greater number of links may similarly be opened. The client first reads index file 50 (FIG. 3B), and graphic 56 (FIG. 3C) is displayed by the client, so that **a user can decide and indicate at which slice of data stream 40 to begin downloading. Responsive to a user input, client 30 selects an appropriate starting slice and begins to download and decode (decompress) files 42, 44, 46, etc.** In the case of a multimedia stream, client 30 reconstructs and outputs the multimedia data for the appreciation of a user. Time stamps in the data stream are used to synchronize the data, so that the multimedia sequence is played back just as it was input at computer 34, preferably with only a minimal necessary transmission and decoding delay.

[REDACTED]

Id. at 10:35-54 (emphasis added). Respondents and the Staff rely on this disclosure to demonstrate that Carmel discloses “automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies.” *See* Resps. Br. at 129; Staff Br. at 178. But this passage expressly states that the selection described is “[r]esponsive to user input”; it does not happen “automatically,” as the claim requires.

Additionally, while this passage of Carmel discloses that the client “selects an appropriate *starting* slice,” Carmel does not disclose “subsequent” requests for files corresponding to “*each* such portion” of the video. RX-0221 (Carmel) at 10:46 (emphasis added); JX-0001 (’564 patent) at claim 1 (emphasis added). All of those elements are necessary to anticipate claim 1 of the ’564 patent.

Staff argues that the combination of Figures 6A and 6B would result in the claimed system where the client selects a specific slice according to the bandwidth limitations between the client and the server. *See* Staff Br. at 178-79. Yet “anticipation is not proven by multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention.” *Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1069 (Fed. Cir. 2017). Anticipation requires “every element of the claimed invention arranged as in the claim.” *Id.* Moreover, even if the figures of Carmel could be combined, Carmel would still fail to disclose any subsequent request after that of the initial selection of the starting slice.

Respondents have not shown by clear and convincing evidence that Carmel anticipates claim 1 of the ’564 patent.

(2) ’156 Patent Limitations 1f and Claim 4

Claim 1 of the ’156 patent recites, in part, “requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting

hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server.” JX-0004 (’156 patent) at claim 1 (referred to above as element 1f of the ’156 patent). Respondents argue, “Carmel discloses 1[a][6][i] for the same reason it discloses 1[b][5][i] of the ’564 patent.” Resps. Br. at 140. As I found above, Carmel does not disclose 1[b][5][i] of the ’564 patent. Respondents further argue that use of HTTP “typically” entails HTTP GET requests. *See id.* at 140-41. However, as discussed above, such arguments do not meet the strict standard for anticipation.

The Staff argues that Carmel discloses this limitation based on Figure 6A. *See Staff Br.* at 180. However, as noted above, there is no single teaching or disclosure in Carmel that clearly discloses the claimed invention “without any need for picking, choosing, and combining various disclosures not directly related to each other.” *Application of Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972).

The Staff further argues that Carmel discloses the HTTP GET request portion of the limitation because the HTTP protocol disclosed in Carmel supported GET requests and using another method would have required special-purpose software. *See Staff Br.* at 180-81. However, given Carmel’s admitted lack of an express disclosure regarding HTTP GET requests, *see Staff Br.* at 181, it is the Staff’s burden to show that HTTP GET requests are “necessarily present in the thing described in the reference,” *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268, 1269 (Fed. Cir. 1991). As discussed above, DISH has adduced evidence that such HTTP GET requests were not “necessarily present” in Carmel’s method.

Respondents have not shown by clear and convincing evidence that Carmel anticipates claim 1 of the ’156 patent.

Claim 4 of the '156 patent recites, in part, “wherein the requesting the sequential streamlets comprises the apparatus transmitting hypertext transport protocol (HTTP) GET requests for selected streamlets, wherein each of the HTTP GET requests identifies the separate file stored by the video server that corresponds to the requested streamlet.” JX-0004 ('156 patent) at claim 4. For similar reasons, Carmel does not anticipate either limitation of claim 4 of the '156 patent.

(3) '554 Patent Limitations 16h-16i

Claim 16 of the '554 patent recites, in part, “place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0002 ('554 patent) at claim 16 (referred to above as elements 16h and 16i of the '554 patent). Respondents argue that “Carmel discloses encoding individual slices and storing them onto a server where they are requested through HTTP GET requests before being received at the clients, one individual encoded slice file at a time, pursuant to the repeated HTTP requests.” Resps. Br. at 152 (citing RX-0001C (Richardson DWS) at Q/A 218). However, above I found that Carmel does not disclose that the individual slices are requested through HTTP GET requests. Carmel does not anticipate claim 16 of the '554 patent.

(4) '555 Patent Limitations 10h-10i

Claim 10 of the '555 patent similarly recites, in part, “place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0003 ('555 patent) at claim 10 (referred to above as elements 10h and 10i of the '555 patent). To meet their burden with respect to this limitation, respondents refer back to argument regarding the similar limitation in the '554 patent. *See* Resps Br. at 155.

I find Carmel does not disclose processor instructions to “place a streamlet request” for the same reasons that Carmel does not disclose requesting a file, as discussed above. Respondents have not shown clear and convincing evidence that Carmel anticipates claim 10 of the ’555 patent.

b) Video Server Limitation – ’564 Patent Limitation 1b

The parties dispute whether claim 11 of Carmel discloses that “multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,” as required by element 1b in claim 1 of the ’564 patent. *See* Resps. Br. at 116-21; Compls. Br. at 189-91. For the reasons below, I find that it does.

Claim 11 of Carmel recites, “A method according to claim 2, wherein encoding the slices comprises encoding slices at a plurality of different quality levels, such that the files corresponding to a given one of the slices have a different, respective data size for each of the quality levels.” RX-0221 (Carmel) at claim 11.

DISH argues that claim 11 is directed to an embodiment of Carmel which does not disclose storing different copies of a video encoded as multiple sets of files on a server. *See* Compls. Br. at 190 (citing CX-0008C (Jeffay RWS) at Q/A 104). However, claim 1 of Carmel recites, in part, “uploading the sequence to a server at an upload rate generally equal to the data rate of the stream, such that the one or more client computers can download the sequence over the network from the server at a download rate generally equal to the data rate.” RX-0221 (Carmel) at claim 1. Uploading the sequence such that one or more client computers could download the sequence necessarily requires storing different copies of the video encoded as multiple sets of files on a server. *See* RX-0001C (Richardson DWS) at Q/A 180. Claim 11 specifically discloses plural files being created for each slice. *See id.* at Q/A 155. Each of the plural files has a data size for each of the quality levels. *Id.*

Carmel thus discloses the limitation, “wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,” in claim 1 of the ’564 patent.

**c) Contiguously Available Files Stored Limitation – ’564 Patent
Claim 5**

The parties dispute whether Carmel discloses the “amount of contiguously available files stored” limitation in claim 5 of the ’564 patent. *See* Resps. Br. at 136-39; Compls. Br. at 192. For the reasons below, I find that it does not.

Respondents’ argument is built around a contention that “a buffer at the input to the media player is implicit” in Carmel “otherwise the media player would stall whenever there was the slightest variation in transfer rate.” *See* Resps. Br. at 136-37 (citing RX-0001C (Richardson DWS) at Q/A 202). Respondents note that Carmel teaches that if the current data transfer rate “is substantially higher than what is needed to receive the successive slices [of content] on time, the client may select a higher quality level to take advantage of the available bandwidth.” RX-0221 at col. 11. Respondents also point out that Carmel teaches the duration of a content slice is “typically between 1 and 5 sec.” *Id.* Stitching these teachings together, respondents reason that if slice durations are relatively short (1 to 5 seconds) and available bandwidth for transfer is high, Carmel’s client “would naturally build up a number of contiguous slices waiting to be decoded” in an input buffer that would be inherently present. *See* Resps. Br. at 136-37. Respondents conclude that the client in Carmel makes a determination that “higher quality playback can be sustained because there are contiguously available files stored in the [inherently present] input buffer.” *Id.* at 138. Therefore, respondents argue, the media player in Carmel “determines that

[REDACTED]

the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player,” as required by claim 5 of the ’564 patent.

I find respondents’ argument is not convincing. While all parties may agree that buffers are common or even desirable in video streaming systems, the fact remains that Carmel does not disclose a buffer. Arguments that Carmel “probably” used a buffer are insufficient. *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002) (anticipation requires every limitation is “‘necessarily present,’ not merely probably or possibly present, in the prior art”).

Indeed, the “build up” problem respondents posit is also never discussed in Carmel. Carmel did take “Internet bottlenecks” into account, but such delays were outside the client. *See* RX-0221 (Carmel) at 11:53-12:12. Given that Carmel contemplated and proposed mitigating processes to address Internet delays, it is not at all clear why Carmel avoided mention of supposed “build up” of slices in the client if Carmel’s device in fact contemplated and addressed that problem.

Moreover, respondents’ chain of reasoning depends on the client device in Carmel performing a non-disclosed evaluation of the amount of non-disclosed content in a non-disclosed buffer and making a non-disclosed determination on how to sustain streaming based on that evaluation. That argument is entirely unsupported by Carmel. Carmel discloses determinations in reaction to more available bandwidth, not determinations based on how many files are in a non-disclosed buffer. For example, Carmel “determines a compression ratio by which to compress the data, based on the collective bandwidth of its open links with server 36.” *Id.* at 11:40-42. Additionally, Carmel discloses that it is tolerable if streaming is not sustained: if there are transmission delays, Carmel teaches “it may be preferable simply to drop the file rather than send it.” *Id.* at 12:56-57. That and other disclosures in Carmel cut against a conclusion that a buffer

[REDACTED]

and evaluation of buffer content is inherent in Carmel. *See* RX-0221 (Carmel) at 11:40-45; 12:13-17, 12:25-35, 12:54-58, 13:30-35) (disclosing options of changing the data compression, changing the duration of the slice of content requested, and utilizing multiple FTP links to maintain a reliable download path, each of which could obviate the need for a buffer).

Because Carmel does not disclose that the client device evaluates the content of a buffer, as respondents suggest, I find that respondents have not shown that Carmel discloses the “amount of contiguously available files stored” limitation in claim 5 of the ’564 patent.

d) Independently Requestable Limitation – ’156 Patent Claim 5

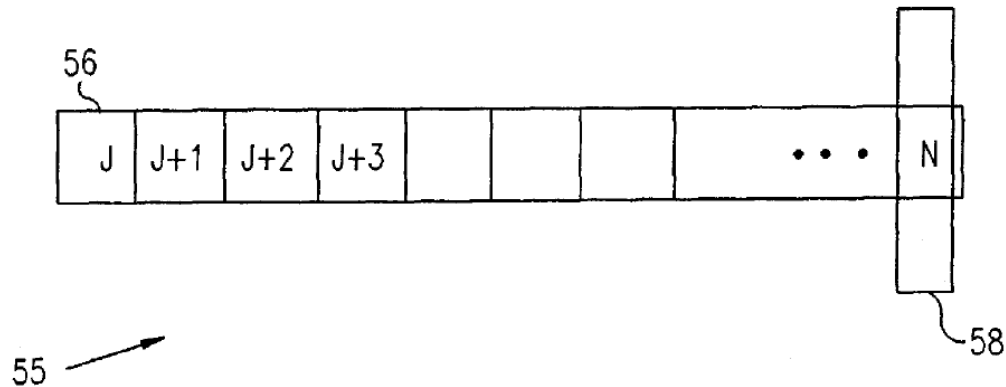
Respondents argue that Carmel discloses the limitation “wherein each of the streamlets of each of the different copies is independently requestable and playable by the apparatus” in claim 5 of the ’156 patent. *See* Resps. Br. at 143-46. I find that it does not.

Respondents argue that Carmel discloses that “the user can choose where to start playback of a stream.” *Id.* at 143. However, claim 5 of the ’156 patent recites that “each of the streamlets *of each of the different copies* is independently requestable and playable by the apparatus.” JX-0004 (’156 patent) at claim 5. Respondents have not shown that Carmel discloses that the user can choose where to start playback of the stream from more than one particular stream.

Carmel recites:

When one of computers 30 reads index file 50 and begins to download stream 40, indicator 58 preferably marks the most recent slice, as shown in FIG. 3C. This is the point at which the download will begin, unless the user of the computer chooses otherwise. If the user wishes to begin the download at an earlier point, he may move indicator 58 to the left along bar 56 to that point, preferably using a mouse or other pointing device, as is known in the art. Indicator 58 may be moved back and forth along bar 56 to jump back and forth along stream 40.

RX-0221 (Carmel) at 8:32-41. This passage refers to Figure 3C of Carmel, which does not display more than a single quality stream:



RX-0221 (Carmel) at FIG. 3C. Dr. Jeffay testified as to this portion of Carmel at the hearing:

So what Carmel allows a user to do via the client is to choose when, effectively when, they want to start in a stream that -- so, remember, Carmel is a system of -- of real-time broadcasting. So the servers are broadcast -- can be broadcasting media, and the user through the app on the client can select a time -- effectively a time to start watching the broadcast.

When that happens, the disclosures in Carmel indicate that the server will simply start pushing data to the client at the appropriate starting point. And the point that I'm making here is that just merely a disclosure of selecting a -- a quality level, plus a starting time, is not -- does not disclose a request for a streamlet and certainly not an independently requestable streamlet.

Jeffay Tr. 641.

Indeed, claim 1 of Carmel recites a “method for real-time broadcasting . . .” and there is no indication in Carmel that a user is able to independently request or play any of the streamlets from a different copy of the stream. Moreover, as I found above, the user in Carmel requests a quality level; there is no evidence of individually selectable streamlets. *See supra* Sec. XIV.B.1.a)(2).

Respondents have not shown that Carmel discloses the limitation “wherein each of the streamlets of each of the different copies is independently requestable and playable by the apparatus” in claim 5 of the '156 patent.

e) Live Event Video Limitations – ’554 Patent Limitation 1p; ’555 Patent Claims 14 and 15

DISH argues that Carmel’s only multi-level data stream embodiment (multi-level data stream 41 and Figure 3D) is not disclosed in the context of a “live” or “real-time” broadcast, and that thus would suggest to one of ordinary skill in the art that it was limited to pre-encoded or on demand applications. *See* Compls. Br at 196-97 (citing CX-0008C (Jeffay RWS) at Q/A 123). However, claim 1 of Carmel recites, “A method for real-time broadcasting . . .” RX-0221 (Carmel) at claim 1. Carmel also discusses “the case of a live broadcast.” *Id.* at 12:54-58. As Dr. Richardson testified, claims 11 and 12 of Carmel describe Carmel’s multi-level stream format and depend from claim 1. *See* RX-0001C (Richardson DWS) at Q/A 172. I find that Carmel discloses the “live event video” limitations in the ’554 and ’555 patents.

f) Conclusion

Respondents have not shown by clear and convincing evidence that Carmel anticipates any of the asserted claims.

2. Anticipation – Akiyama

Respondents contend that U.S. Patent Application No. 2004/0202109 to Akiyama anticipates each of the asserted claims. *See* Resps. Br. at 164-78. Akiyama was filed on August 28, 2003, and published October 14, 2004, and therefore qualifies as prior art to the asserted patents under pre-AIA 35 U.S.C. § 102(e). RX-0368 (Akiyama). The Staff argues that Akiyama does not anticipate any of the asserted claims. *See* Staff Br. at 194-201. For the reasons below, I find that respondents have not shown by clear and convincing evidence that Akiyama anticipates any of the asserted claims because each independent claim requires a “request” that Akiyama does not disclose.

a) Request Limitations – ’564 Patent Limitation 1g; ’156 Patent Limitation 1f; ’554 Patent Limitations 16h-16i; ’555 Patent Limitations 10h-10i

Respondents have not shown by clear and convincing evidence that Akiyama anticipates the asserted claims because respondents have not shown that Akiyama discloses requesting specific files from the video server.

For instance, claim 1 of the ’564 patent recites, in part, “automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies.” JX-0001 (’564 patent) at claim 1. Respondents contend that “the receiving terminal unit 100 requests a plurality of fragments from the server based on the time index starting with T_0 when the receiving terminal requests to stream a video.” Resps. Br. at 166 (citing RX-0368 (Akiyama), ¶ [0049]; RX-0001C (Richardson DWS) Q/A 261-63). Respondents cite Akiyama at paragraph 49, which does not refer to a request. Respondents additionally cite Akiyama at paragraph 39, which recites:

The receiving bit rate-monitoring unit 110 performs a monitoring operation with respect to the received bit rate from a time in which the trigger is applied from the monitoring trigger control unit 109. In the case where a result of monitoring is displaced out of a predetermined bit rate range, a command transmission unit 111 requests an image data bit rate switching in the distribution server 200. When the result of the monitoring operation is in a predetermined bit rate range, it does not request a bit rate switching in the distribution server 200. The command transmission unit transmits commands of a start of distribution of image data, a stopping of the distribution of image data and an image bit rate switching request and the like to the distribution server 200.

RX-0368 (Akiyama), ¶ [0039]. Akiyama discloses that the “command transmission unit 111 requests an image data bit rate switching in the distribution server 200,” but this portion of Akiyama does not disclose “requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies.” Rather, Akiyama

[REDACTED]

discloses that the receiving terminal monitors the received bit rate in transmissions from the distribution server and “requests an image data bit rate switching in the distribution server” when the “result of monitoring is displaced out of a predetermined bit rate range.” *Id.*, ¶ [0041].

Respondents further argue that this “request could be, for example, when the receiving terminal unit switches bit rates based on the determination made by the receiving terminal unit when it determines it should switch bit rates and sends a request to the server to switch bit rates.” Resps. Br. at 167 (citing RX-0368 (Akiyama), ¶¶ 39, 79; RX-0001C (Richardson DWS) at Q/A 264-65). However, the cited portion of Akiyama recites a client transmission of “an image bit rate switching request,” that refers to a request to change the bitrate of the transmitted content, not a request for an individual portion from one of the copies of a stream as required by the claim. Akiyama’s bit rate switching request is merely a request sent sporadically and only when the monitoring criteria require adjustment to the incoming stream. It is not a request for each individual portion in a stream. *See* CX-0008C (Jeffay RWS) at Q/A 138.

Respondents additionally cite paragraph 79 of Akiyama, but this paragraph only discloses requests for starting and stopping the distribution, rather than requests for individual files. In this regard, Akiyama’s distribution server 200 distributes the fragments without specific requests for specific files from the receiving terminal 100.

Respondents contend that “if the receiving terminal in Akiyama requests when the bit rate should be switched, the bit rate switch request is effectively a request for fragments starting with the next available time index.” Resps. Br. at 166-67. Although requesting a switch in the bit rate might be related to a request for a different quality level, it is not a request for specific files stored on the server.

Similarly, claim 1 of the '156 patent recites, in part, “requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets.” JX-0004 ('156 patent) at claim 1. Respondents refer back to their argument regarding the '564 patent. *See* Resps Br. at 171. Akiyama does not disclose “requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets” because Akiyama does not disclose requesting individual portions stored on the video server.

Claim 16 of the '554 patent recites, in part, “place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0002 ('554 patent) at claim 16. Respondents argue that Akiyama discloses “requesting fragments from the server, including a request when the receiving terminal unit requests a switch to a different bit rate.” Resps Br. at 175 (citing RX-0368 (Akiyama) ¶¶ 39, 79; RX-0001C (Richardson DWS) at Q/A 287-89). However, switching to a different bit rate based on changing conditions does not disclose the recited portions of claim 16 of the '554 patent because there is no specific “streamlet request.”

Claim 10 of the '555 patent similarly recites, in part, “place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0003 ('555 patent) at claim 10. Respondents refer back to argument regarding the '554 patent. *See* Resps Br. at 177. Akiyama does not disclose processor instructions to “place a streamlet request” because of the absence of disclosure regarding specific streamlets.

b) TCP Limitations – ’564 Patent Limitation 1a; ’156 Patent Limitation 1a and Claim 2

Respondents have not shown by clear and convincing evidence that Akiyama anticipates claim 1 of the ’564 patent and claims 1 and 2 of the ’156 patent because Akiyama does not disclose streaming via a TCP connection over the Internet.

Respondents do not contend that Akiyama explicitly discloses streaming via a TCP connection, but rely on inherency, arguing that one of ordinary skill in the art would have understood that the Internet communications used in Akiyama would have involved the use of TCP/IP for data transfer. *See* Resps. Br. at 165.

An element may be inherently disclosed only if it “is ‘necessarily present,’ not merely probably or possibly present, in the prior art.” *Rosco, Inc. v. Mirror Lite Co.*, 304 F.3d 1373, 1380 (Fed. Cir. 2002) (quoting *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002)). Respondents do not contend that TCP/IP data transfer is “necessarily present” in the use of Akiyama’s invention. *See id.* Respondents cite paragraph 38 of Akiyama, Resps. Br. at 165, which recites:

Image data received by the receiving terminal unit 100 is data that has been compressed by a predetermined coding system, such as MPEG or the like, and the image data is distributed from a distribution server 200 to the receiving terminal 100 through a radio communication network 112 and a relay station 113.

RX-0368 (Akiyama), ¶ [0038]. The above-recited paragraph refers to distributing the image data “through a radio communication network 112 and a relay station 113,” not through the use of TCP/IP. Respondents further cite the testimony of Dr. Richardson, who testifies as follows:

Akiyama (RX-0368) discloses a receiving terminal connected to a distribution server to download content via the web, including HTML data. In my opinion, a person of skill in the art would recognize that Web and HTML data is most commonly distributed over TCP/IP connections via HTTP. It is therefore my opinion that a person of ordinary skill would have recognized that the adaptive bit

[REDACTED]

rate streaming system described in Akiyama would have used a TCP connection or it would have been obvious to use a TCP connection. In the alternative, it is my opinion that a person of ordinary skill would have understood that this connection between the client device and server device could have been any one of several types of connection, including a “transport control protocol (TCP) connection” over the internet, which was one of the most common protocols in the internet at the time of the alleged invention.

RX-0001C (Richardson DWS) at Q/A 247. This conclusory testimony is insufficient to demonstrate that Akiyama inherently discloses the use of TCP/IP. *See Koito Mfg. Co. v. Turn-Key-Tech, LLC*, 381 F.3d 1142, 1152 (Fed. Cir. 2004) (“General and conclusory testimony . . . does not suffice as substantial evidence of invalidity.”). Dr. Richardson does not even cite a specific paragraph in Akiyama as allegedly disclosing the limitation in question.

Moreover, Akiyama explicitly compares his invention, which uses a radio communication network, RX-0368 (Akiyama), ¶ [0038], to a system that uses the Internet. Akiyama recites:

Also, in the case of image distribution under application of only a wired line, **such as the internet**, variation in the data transfer speed is generated under the influence of the applied state of the line. However, in general, **the wired line** frequently has a far wider data transfer area as compared with that of **the radio line** and the variation of the receiving bit rate at the terminal hardly produces a problem. In turn, it is difficult in practice to assure a wide data transfer area with the radio line in view of the restrictions on the international standards or limitations on performance of the communication device or the like. Further, due to a characteristic of the radio network, the device may easily be influenced by attenuation or reflection of the electromagnetic wave and by the surrounding environment, and, additionally, a variation in the data transferring speed frequently happens. As described above, the method for effecting the image distributing operation of the present invention, which has been described up to now, is particularly effective in the case wherein it is applied to an image distributing system **using a radio line where a variation in the data transfer speed may easily occur**.

Id., ¶ [0100] (emphasis added). As Dr. Jeffay testified, “The ‘radio’ distribution context that Akiyama is addressing does not involve TCP/IP communications, which are a set of protocols for communicating via the Internet. For example, an ordinary artisan would understand that TCP is

one of the foundational Internet communications protocols for communication via computer networks.” CX-0008C (Jeffay RWS) at Q/A 140.

Therefore, respondents have not shown by clear and convincing evidence that Akiyama discloses the use of TCP.

c) Conclusion

Respondents have not shown by clear and convincing evidence that Akiyama anticipates any of the asserted claims.

3. Obviousness – Carmel

Respondents argue that: (1) Carmel alone renders obvious limitations 1a, 1b and 5 of the ’564 patent, and limitations 16a and 16e of the ’554 patent, *see* Resps. Br. at 156-61; (2) Carmel in view of U.S. Patent No. 7,386,627 to Lango renders obvious limitation 1b of the ’564 patent and limitation 1b of the ’156 patent, *see id.* at 161-63; and (3) Carmel in view of Lango and International Patent Publication WO2002-45372 to Walker renders obvious limitation 16e of the ’554 patent, *see id.* at 163.

Lango was filed on January 29, 2002, and is prior art to the asserted patents. RX-0387 (Lango). International Patent Publication WO2002-45372 to Walker was filed on November 28, 2001, was published on June 6, 2002, and is prior art to the asserted patents. RX-0388 (Walker). For the reasons below, I find that respondents have not shown by clear and convincing evidence that Carmel, with or without Lango and Walker, renders obvious any of the asserted claims at least because each independent claim requires a “request” and the proposed combinations do not arrive at an invention having every limitation of the claims, including the claimed “request.”

a) Carmel Alone

(1) Request Limitations – ’564 Patent Limitation 1g; ’156 Patent Limitation 1f; ’554 Patent Limitations 16h-16i; ’555 Patent Limitations 10h-10i

Respondents argue that it would have been obvious to one of ordinary skill in the art to combine the separate embodiments of Carmel. *See* Resps. Br. at 156-57. The Staff argues that Carmel itself expressly combines the embodiments, and that the evidence shows that Carmel does not teach away from combining its embodiments. *See* Staff Br. at 193. However, neither respondents nor the Staff address whether one of ordinary skill in the art would find that the proposed combination would yield predictable results, would have involved simple substitution of known methods, or would have been “obvious to try” the combination with some expectation of success to arrive at the claimed invention, as required to establish obviousness. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007).

Moreover, as discussed above, Carmel discloses that the client selects a quality level rather than a specific file. *See* RX-0221 (Carmel) at. 10:64-11:8. Carmel recites that the client “periodically ... makes an assessment of the rate of data transfer over the link from the server and, if necessary, changes the quality level accordingly.” RX-0221 (Carmel) at 11:9-11. As Dr. Richardson testified, Carmel’s disclosure of selecting “one of the available quality levels in the stream” in Figure 6B and the related descriptions in Carmel’s column 11 do not state that the client is actually selecting portions of files or making a specific file request. Richardson Tr. 385–386. Carmel’s client is limited to selecting a quality level rather than individual files. *See* CX-0008C (Jeffay RWS) at Q/A 111.

Respondents have not shown that Carmel alone would render obvious an invention having the claimed “request” functionality.

(2) Video Server Limitation – '564 Patent Limitation 1b

I find that respondents have shown that Carmel inherently discloses limitation 1b of claim 1 of the '564 patent: “wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files.”

As noted above, claim 1 of Carmel recites, in part, “uploading the sequence to a server at an upload rate generally equal to the data rate of the stream, such that the one or more client computers can download the sequence over the network from the server at a download rate generally equal to the data rate.” RX-0221 (Carmel) at claim 1. Uploading the sequence such that one or more client computers could download the sequence necessarily requires storing the video on a server. *See* RX-0001C (Richardson DWS) at Q/A 180. Claim 11 of Carmel specifically discloses plural files being created for each slice. *See id.* at Q/A 155. Each of the plural files has a data size for each of the quality levels. *Id.* Thus, Carmel discloses different copies of the video encoded as multiple sets of files on a server.

Respondents have thus shown that Carmel inherently discloses “multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files.”

However, as I found above, respondents have not that Carmel discloses the “request” limitations of each of the asserted independent claims. *See supra* Sec. XIV.B.3.a)(1). Neither have respondents shown why an invention embodying the “request” limitations would have been obvious to a person of ordinary skill in the art viewing Carmel alone at the time of the invention.

(3) Contiguously Available Files Stored Limitation – '564 Patent Claim 5

As I found above, Carmel does not disclose the “amount of contiguously available files stored” limitation in claim 5 of the '564 patent. *See supra* Sec. XIV.B.1.c). Respondents argue it

would have been obvious to one of ordinary skill in the art to assess the quantity of data stored in Carmel's buffer, because with an adequate amount of data in the buffer, "the upshift to a higher quality would be more likely to continue playback without interruption." Resps. Br. at 160.

Again, respondents rely on an undisclosed buffer in Carmel, and argue that an ordinary artisan would have found it obvious to have a buffer to store data on the media player. *See id.* at 159 (citing RX-0001C (Richardson DWS) at Q/A 202). But Carmel discloses multiple alternatives that would not necessarily require a buffer, including allowing an interruption in streaming, changing the data compression, changing the duration of the slice of content requested, and utilizing multiple FTP links to maintain a reliable download path. *See* RX-0221 (Carmel) at 11:40-45; 12:13-17, 12:25-35, 12:54-58, 13:30-35).

Moreover, respondents find no support in Carmel for their theory and only cite their own expert's testimony to contend that Carmel renders obvious this claim. *See* Resps. Br. at 158-60. Unsupported expert opinion cannot demonstrate inherent disclosure of this limitation. *See TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1360 (Fed. Cir. 2019).

Respondents have not shown that Carmel renders obvious the "amount of contiguously available files stored" limitation in claim 5 of the '564 patent.

b) Motivation to Combine Carmel and Lango

I find that respondents have not adduced evidence demonstrating a motivation to combine Carmel and Lango. Respondents argue that companies in the streaming industry would look at the technology that others were using at the time, including how files are stored, in streaming video systems such as those disclosed in Carmel and Lango. *See* Resps. Br. at 162 (citing RX-0001C (Richardson DWS) at Q/A 181). This is insufficient motivation to combine Carmel and Lango.

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Carmel and Lango are not directed to the achieving the same purposes. Lango requires specialized components, including an intelligent application-layer protocol aware router and specialized streaming media caches or accelerators within a specialized data network to improve data streaming and improve storage methods. RX-0387 (Lango) at 4:42-5:1, 1:58-61. Carmel, by contrast, is directed to using “common, existing server and network infrastructure” components without the need for “dedicated broadcast computer system[s]” enabled via a “personal computer.” *See* RX-0221 (Carmel) at 1:50-67. As Lango’s improvements are directed to optimizing storage on dedicated streaming cache devices, one of ordinary skill in the art would not have been motivated to apply Lango’s teachings to the general purpose web server of Carmel. *See* CX-0008C (Jeffay RWS) at Q/A 108.

As respondents have not shown a motivation to combine Carmel and Lango, they have also failed to show a motivation to combine Carmel, Lango, and Walker. I determine that respondents have not shown by clear and convincing evidence that Carmel, whether alone or combined with Lango and Walker, renders obvious any of the asserted claims.

4. Obviousness – Akiyama

Respondents argue that: (1) Akiyama alone renders obvious limitations 1a-1e of the ’564 patent, limitation 1f and claim 2 of the ’156 patent, and limitations 16p, 16e, and 16f of the ’554 patent, *see* Resps. Br. at 178-82; (2) Akiyama in view of U.S. Patent No. 5,414,455 to Hooper renders obvious limitation 1b of the ’564 patent, limitations 1b and 1f and claims 4 and 5 of the ’156 patent,²⁵ limitations 16c-16d of the ’554 patent, and limitations 10c-10d of the ’555 patent,

²⁵ Respondents additionally contend that Akiyama in view of Hooper renders obvious claim 7 of the ’156 patent. *See* Resps. Br. at 184. However, DISH is no longer asserting claim 7 of the ’156 patent. *See supra* Sec. I.A. Respondents’ argument about claim 7 is therefore moot.

see id. at 182-85; and (3) Akiyama in view of Hooper and Walker renders obvious the preamble of 16 and claim 20 of the '554 patent and claims 14 and 15 of the '555 patent, *see id.* at 163. U.S. Patent No. 5,414,455 to Hooper was filed on July 7, 1983, and is prior art to the asserted patents. RX-0374 (Hooper). As discussed above, Walker was filed on November 28, 2001, and is prior art to the asserted patents. RX-0388 (Walker). For the reasons below, I find that respondents have not shown by clear and convincing evidence that Akiyama, with or without Hooper or Walker, renders obvious any of the asserted claims at least because each independent claim requires a “request” and the proposed combinations do not arrive at an invention having every limitation of the claims, including the claimed “request.”

a) Request Limitations – '564 Patent Limitation 1g; '156 Patent Limitation 1f; '554 Patent Limitations 16h-16i; '555 Patent Limitations 10h-10i

As I found above, respondents have not shown that Akiyama discloses the request limitations. *See supra* Sec. XIV.B.2.a). Respondents do not argue that Akiyama, either alone or when combined with Hooper or Walker, results in an invention with these limitations. *See Resps. Br.* at 178-87.

Respondents have not shown by clear and convincing evidence that an invention including the “request” limitations would have been obvious if an ordinary artisan considered Akiyama alone or with the Hooper or Walker references.

b) TCP Limitations – '564 Patent Limitation 1a; '156 Patent Limitation 1a and Claim 2

Respondents have not shown by clear and convincing evidence that Akiyama renders obvious an invention including the TCP limitations in claim 1 of the '564 patent and claims 1 and 2 of the '156 patent. As discussed above with respect to anticipation, Akiyama does not disclose

streaming via a TCP connection over the Internet but rather addresses problems encountered in radio communication networks. *See supra* Sec. XIV.B.2.b). Respondents argue that it “would have been obvious to a person of skill that the connection between the receiving terminal 100 and the server could have been any one of several types of connection, including TCP connections.” Resps. Br. at 178. However, Akiyama only discloses the receiving terminal streaming via radio infrastructure. *See* RX-0368 (Akiyama), ¶ [0041]; CX-0008C (Jeffay RWS) at Q/A 140. Akiyama discloses transmitting a TV broadcast to a distribution server over the Internet (Figure 21), but the distribution server nevertheless then transmits the content via radio transmission. *See* RX-0368 (Akiyama), ¶¶ [0091-92]; CX-0008C (Jeffay RWS) at Q/A 140. Given those teachings, it is unclear why a person of skill in the art would even consider a TCP connection between the server and the receiving terminal. Thus, respondents have not shown by clear and convincing evidence that Akiyama renders obvious an invention including the TCP limitations.

c) HTTP GET Limitations – ’156 Patent Limitation 1f

Respondents have not shown that Akiyama, with or without Hooper, renders obvious an invention including the HTTP GET limitation in claim 1 of the ’156 patent.

Respondents argue that it would have been obvious to modify “the system in Akiyama so that the receiving terminal 100 issues HTTP GET requests with a time index for specific fragments,” and that “[b]ecause Akiyama discloses that it is for distributing content over the web, including HTML data, a person of skill would have recognized that web data and HTML content is most commonly distributed over TCP/IP connections using HTTP standard messages, like HTTP GET requests.” Resps. Br. at 181. However, as discussed above, Akiyama does not teach distributing content over the Internet from a server to the receiving terminal. *See supra* Sec. XIV.B.2.b). Hence, Akiyama does not teach or suggest distributing content via HTTP GET

requests. Accordingly, the evidence does not clearly and convincingly support finding that Akiyama renders claim 1 of the '156 patent obvious. *See* CX-0008C (Jeffay RWS) at Q/A 152.

With respect to Hooper, respondents have not adduced evidence does not clearly and convincingly explaining how or why one of ordinary skill in the art would combine Hooper with Akiyama. *See id.* at Q/A 153. Furthermore, respondents argue that “person of skill would have further realized that the requests for specific segments in Hooper could have been implemented in any number of a different protocols,” but Hooper is silent on using HTTP GET requests to access any such streamlets and respondents provide no convincing explanation of why one of ordinary skill in the art would have found it obvious to do so. *See id.*

d) Video Server Limitations – '564 Patent Limitation 1b; '156 Patent Limitation 1b

Respondents have not shown that Akiyama, with or without Hooper, renders obvious an invention including the video server limitations in claim 1 of the '564 patent and claim 1 of the '156 patent.

Respondents argue that “would have been obvious to a person of skill that the different image bit rates could have been stored separately on the server since those bit rates were already broken up into different fragments.” Resps. Br. at 179. However, Akiyama implies that the fragments should be already broken up when stored because it depicts the fragments separately in the data structure. *See id.* (citing RX-0368 (Akiyama), ¶¶ 43-44, Fig. 5; RX-0001C (Richardson DWS) at Q/A 250). The information encoded into each fragment in Akiyama is only generated at distribution time, not beforehand during storage. *See* CX-0008C (Jeffay RWS) at Q/A 142-43. Those teachings cut against a conclusion of obviousness.

Hooper does not render obvious storing multiple versions or copies of a video as multiple

sets of files. Hooper discloses encoding archived video into multiple time-based “frames” which can be addressed for on demand retrieval, playback, and control by multiple devices. Hooper (RX-0374) at 1:61-2:31. Hooper is also silent on storing its segments as separate “files.” *See* CX-0008C (Jeffay RWS) Q/A 144.

Respondents have not shown by clear and convincing evidence that Akiyama, with or without Hooper, renders obvious an invention having the video server limitations in claim 1 of the ’564 patent and claim 1 of the ’156 patent.

e) Live Event Video Limitations – ’554 Patent Limitation 1p; ’555 Patent Claims 14 and 15

Above I found that Akiyama does not disclose or render obvious an invention with instructions for a “streamlet request” or instructions to “place a streamlet request” because of the absence of disclosure in Akiyama regarding specific streamlets. *See supra* Secs. XIV.B.2.a), XIV.B.4.a). Respondents have not shown that Akiyama, with or without Hooper or Walker, renders obvious claim 16 of the ’554 patent, which recites, in part, “place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0002 (’554 patent) at claim 16. Similarly, claim 10 of the ’555 patent recites, in part, “place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0003 (’555 patent) at claim 10. Respondents have thus not shown that Akiyama, with or without Hooper or Walker, renders obvious claim 10 of the ’555 patent.

* * *

Respondents have thus not shown by clear and convincing evidence that Akiyama, with or without Hooper or Walker, renders any of the asserted claims obvious.

5. Obviousness – RealNetworks

Respondents contend that RealNetworks' RealSystem, including RealSystem G2, RealSystem 7, RealSystem 8, and the RealOnePlayer, renders obvious all of the asserted claims. *See* Resps. Br. at 187-227. Respondents additionally contend that RealNetworks in view of Hooper renders obvious limitations 1b-1e of the '564 patent, *see id.* at 227-31, and that RealNetworks in view of Hooper and Walker renders obvious limitation 16e of the '554 patent, *see id.* at 231-32. For the reasons below, I find that respondents have not shown by clear and convincing evidence that Akiyama, with or without Hooper or Walker, renders obvious any of the asserted claims at least because each independent claim requires a "request" and the proposed combinations do not arrive at an invention having every limitation of the claims, including the claimed "request."

a) Status as Prior Art

DISH argues that respondents have not established that the RealNetworks system qualifies as prior art under pre-AIA § 102(b) because "[r]espondents have not identified a specific 'system' that was available, and instead rely on a scattered collection of documents, programs, testing, and testimony that describe many different products and many different versions of those products." Compls. Br. at 219. Yet Dr. Jeffay testified as to the public availability and prior art status of the RealNetworks system. Jeffay Tr. 612–613.

Dr. Richardson tested a version of the RealNetworks system that was publicly available before 2004. Mr. Jerry Black, an employee of RealNetworks from 1995 to 2009, testified that RealNetworks' RealSystems was used to stream live video content prior to 2004 and that

[REDACTED]

RealPlayer G2, RealPlayer 7, RealPlayer 8, RealProducer, and RealServer were publicly available before 2004. *See, e.g.*, RX-0003 (Black DWS) at Q/A 3, 25, 28. Respondents further adduced evidence demonstrating that the associated manuals were accessible on the Internet before 2004. RX-0568 (RealNetworks declaration); RX-0569 and RX-0570 (Internet Archive declarations).

Respondents have thus provided sufficient evidence establishing that the RealNetworks system qualifies as prior art.

b) Obviousness

(1) Request Limitations – ’564 Patent Limitation 1g; ’156 Patent Limitation 1f; ’554 Patent Limitations 16h-16i; ’555 Patent Limitations 10h-10i

Respondents contend that the RealNetworks system “discloses automatically requesting subsequent portions of the video, including requests for when to switch bit rates based on a determination made by the client.” Resps. Br. at 199. Specifically, respondents argue that, when the user sends a request for a different bitrate in the RealNetworks system, that same request is also a request for “‘subsequent portions of the video or subsequent groups of pictures beginning with an I-frame’ from the next switch point, or Presentation Time Stamp onward.” *Id.* at 200 (quoting RX-0001C (Richardson DWS) Q/A 325).²⁶

Dr. Richardson testified as follows:

During our testing, as discussed above in relation to claim elements **1[b][3]** and **1[b][5][i]**, the **media player, RealPlayer 8**, running on an end user station, created a network connection with the **video server, RealServer, and automatically requested subsequent portions of the video** from **RealServer** by sending new “SET_PARAMETER” requests whenever bandwidth availability was throttled and cleared. The decision to send these requests was made by RealPlayer independently of any actions of the end user, hence these requests were made **automatically**.

²⁶ An I-frame refers to an intra-coded picture used as a reference frame in streaming the video. *See* RX-0001C (Richardson DWS) at Q/A 316 (citing RX-0374 (Hooper) at 6:63-64).

Using NetBalancer, throttling was applied to limit the bandwidth available for the connection between RealPlayer 8 and RealServer. Subsequently, in the Wireshark log at Packet Number 6328, RealPlayer 8 sent a new “SET_PARAMETER” request to subscribe to new ASM Rules. In this packet, RealPlayer 8 unsubscribed from Rules 10 and 11, which correspond to the highest quality video, and subscribed to Rules 8 and 9, which correspond to the SureStream encoding at 193.0 Kbps. This constitutes RealPlayer requesting to shift to a different stream within the SureStream .rm container, *i.e.*, to **automatically request subsequent portions of the video**, or subsequent groups of pictures beginning with an I-frame. Likewise, after throttling was cleared via NetBalancer, at Packet Number 8449, we saw RealPlayer 8 send a new “SET_PARAMETER” request to RealServer. In this packet, RealPlayer 8 unsubscribed from Rules 8 and 9 and subscribed to Rules 10 and 11, which correspond to the video encoded at 385.9 Kbps. This too is an **automatic request** from **RealPlayer 8** to **RealServer** for **subsequent portions of the video**, or subsequent groups of pictures beginning with an I-frame.

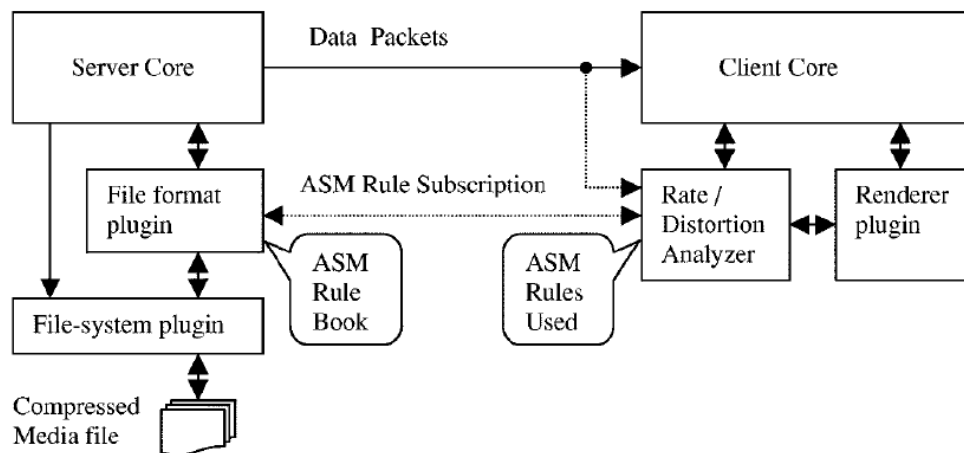
RX-0001C (Richardson DWS) at Q/A 325.

Respondents argue that the decision to send new “SET_PARAMETER” requests and switch streams is made by RealPlayer independently of any actions of the end user, thus demonstrating that these requests were made automatically. *See* Resps. Br. at 199 (citing RX-0001C (Richardson DWS) at Q/A 325). However, as Dr. Jeffay testified, the “SET_PARAMETER” packet sent from the RealNetworks client to the server “subscribe[s] to a rule” and does not individually request specific files or streamlets from a server. CX-0008C (Jeffay RWS) at Q/A 173.

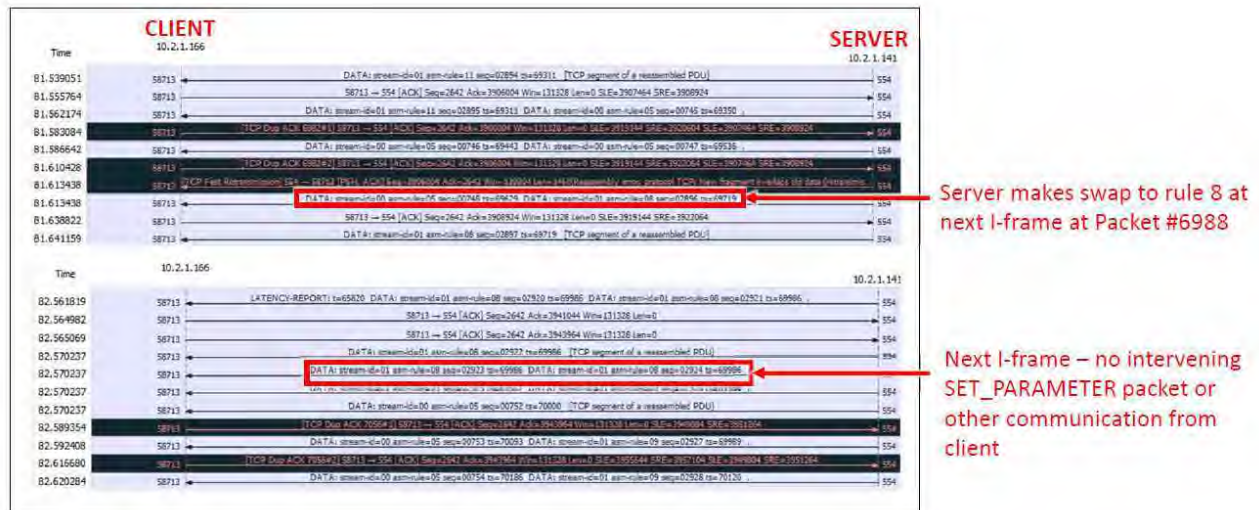
Respondents argue that the “SET_PARAMETER” requests “are also requests for ‘subsequent portions of the video or subsequent groups of pictures beginning with an I-frame’ from the next switch point, or Presentation Time Stamp onward.” Resps. Br. at 200 (quoting RX-0001C (Richardson DWS) at Q/A 325). However, Dr. Richardson described the “SET_PARAMETER” packet in combination with an “ASM Rulebook.” *See* RX-0001C (Richardson DWS) at Q/A 319. Specifically, Dr. Richardson quoted the Conklin (RX-0228) reference at length:

ASM is a mechanism that allows the client (RealPlayer) to communicate efficiently the type of the encoding that should be “synthesized” by the server in order to minimize the distortion of the received information. We present the structure of the server’s and client’s components involved in the ASM process in Fig. 6. Compressed media files are accessed by server with the help of the *file system* and *file format* plug-ins. The file format plug-in has knowledge about the way data are compressed and stored in the media file, and is capable of producing various combinations of the encoded streams as they are requested by the client. To produce such combinations, the file format plug-in uses so-called *ASM rules*. These rules are based on sophisticated, fully programmable syntax and can be used to describe various means of channel adaptation ranging from simple priorities assigned to different packets, to expressions describing various combinations of bandwidth, packet loss, and efforts of loss on the reconstructed signal that can be measured by the client. The complete set of the *ASM rules* is stored in the compressed media file as the *ASM rule book*. At the initial phase of the communication, the ASM rule book is transferred to the client. In turn, the client collects the information about the channel, parses the ASM rule book, and sends the server a request to subscribe to a rule or combination of rules that match current statistics in the channel. When the server receives the request to subscribe to a rule, it passes it to the file format plugin, which in turn begins to mix data according to its knowledge of their structure.

Id. (quoting RX-0228 (Conklin) at 277) (emphasis added in RX-0001C). Figure 6 of Conklin is reproduced below.



RX-0228 (Conklin) at Fig. 6.



CDX-0008C (Jeffay Demonstratives (RX-0554 (2021-11-18_Wireshark_Log.pcapng))) at 49.

As shown at CDX-0008C at 48, a “SET_PARAMETER” packet is sent from the client to the server subscribing to ASM rules 8 and 9. After this, the RealServer continues to send data in accordance with rules 10 and 11 as it has not yet reached the next I-frame. The only communication from the Client to the Server are ACK messages to acknowledge receipt of the data from the Server. *See* CX-0008C (Jeffay RWS) at Q/A 175. Then, in CDX-0008C at 49, the Server selects and sends data in accordance with rules 8 and 9 starting with Packet #6988. The server then sends data for the next I-frame beginning at Packet #7052 without receiving any additional “SET_PARAMETER” requests from the Client. Again, the only communication from the Client to the Server are the same ACK messages seen on the prior demonstrative. *See* CX-0008C (Jeffay RWS) at Q/A 175.

Similarly, claim 1 of the ’156 patent recites, in part, “requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets.” JX-0004 (’156 patent) at claim 1. Respondents refer back to their argument regarding the ’564 patent. *See* Resps Br. at 208. RealPlayer does not render obvious “requesting sequential streamlets

of one of the copies from the video server according to the playback times of the streamlets” because RealPlayer does not teach or suggest requesting individual streamlets stored on the video server.

Claim 16 of the ’554 patent recites, in part, “place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0002 (’554 patent) at claim 16. Respondents argue that “RealNetworks discloses this limitation because RealPlayer ‘chooses which files to receive based on its available bandwidth.’” Resps Br. at 220 (quoting RX-0236 (RealSystem G2 Production Guide) at RESP-PA03522). However, subscribing to a different rule based on changing conditions does not disclose the recited portions of claim 16 of the ’554 patent because there is no specific “streamlet request.”

Claim 10 of the ’555 patent similarly recites, in part, “place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0003 (’555 patent) at claim 10. Respondents refer back to argument regarding the ’554 patent. *See* Resps Br. at 226. RealPlayer does not teach or suggest “place a streamlet request” because of the absence of disclosure regarding specific streamlets.

Respondents have not shown by clear and convincing evidence that RealPlayer renders obvious any of the asserted claims.

(2) Video Server Limitation – ’564 Patent Limitation 1b

Respondents have not shown that RealPlayer renders obvious the limitation “wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files” in claim 1 of the ’564 patent.

Respondents argue that “RealNetworks’ single SureStream file consists of multiple encodings and multiple segments (multiple groups of pictures beginning with an I-frame).” Resps. Br. at 192 (citing RX-0001C (Richardson DWS) at Q/A 316). Hence, respondents concede that RealNetworks does not disclose storing “multiple different copies of the video encoded at different bit rates” as “multiple sets of files.” See CX-0008C (Jeffay RWS) at Q/A 176. Dr. Richardson also testified that he “observed that SureStream saved one file to RealServer containing therein these multiple different copies of the video at different bit rates” and that “RealNetworks discloses storing multiple different copies of the video encoded at different bit rates as one file at RealServer.” RX-0001C (Richardson DWS) at Q/A 316. Thus, the RealNetworks’ client cannot access subfiles or streamlet portions by file requests.

Respondents further argue that “it would have been obvious to a [person of ordinary skill in the art] that these multiple groups of pictures each beginning with an I-frame would meet the claim element of multiple sets of files.” Resps. Br. at 193 (citing RX-0001C (Richardson DWS) at Q/A 316). However, the prior art suggests that storing streams in a “single SureStream file” actually “facilitates their efficient retrieval by the server” in the RealNetworks system such that one of ordinary skill in the art would not be motivated to implement a less efficient option of using multiple sets of files. RX-0228 (Conklin) at 3. Moreover, RealNetworks had access to both technologies and did not combine them. Accordingly, the evidence does not show that the disclosure of the RealNetworks system alone would render this limitation obvious.

Respondents further argue that it would have been obvious to combine RealNetworks with Hooper because “RealNetworks and Hooper both disclose systems for streaming video.” Resps. Br. at 227 (quoting RX-0001C (Richardson DWS) at Q/A 316). However, Dr. Richardson does not explain why one of ordinary skill in the art would seek to “store or cache” RealNetworks’

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“groups of pictures beginning with an I-frame” as multiple sets of files. CX-0008C (Jeffay RWS) at Q/A 180. Moreover, as shown in Figure 6 of Hooper, “the video 100 is transferred as a moving or rolling viewing window called a video segment 200 having a time-interval based span or size. The video 100 is transferred by moving the viewing window or video segment 200 forward, from the start to the end, at a substantially constant speed to coincide with the play-back speed of the video 100.” RX-0374 (Hooper) at 9:49-56; Fig. 6. Respondents have not adduced a convincing reason as to why one of ordinary skill in the art would have been motivated to combine the SureStream technology with Hooper’s disclosures.

Respondents have not shown by clear and convincing evidence that RealPlayer, with or without Hooper, renders obvious claim 1 of the ’564 patent.

(3) Time Indexes– ’564 Patent Limitation 1e

Respondents argue that RealNetworks’ “Presentation Time Stamps” are the claimed “time indexes.” *See* Resps. Br. at 198 (citing RX-0001C (Richardson DWS) at Q/A 322). However, respondents have not shown that the ASM Rules or the “SET_PARAMETER” packet, which respondents map to the “requesting” element, request based on the “Presentation Time Stamps.” *See* CX-0008C (Jeffay RWS) at Q/A 183; RX-0559 (2021-11-18_ASM_Rulebook.rtf); RX-0554 (2021-11-18_Wireshark_Log.pcapng). Accordingly, even if the Presentation Time Stamps were considered “time indexes,” RealNetworks does not disclose or suggest requesting files “based on the time indexes” as claimed.

Respondents have thus not shown by clear and convincing evidence that RealPlayer renders obvious claim 1 of the ’564 patent.

(4) Live Event Video Limitations – ’554 Patent Limitation 1p; ’555 Patent Claims 14 and 15

Respondents have shown that RealPlayer could and did stream live event videos during the relevant time period.

As Jerry G. Black testified, RealNetworks streamed live events prior to 2004. RX-0003 (Black DWS) at Q/A 24-25. Similarly, Level 3 Communication’s Sandpiper Footprint content delivery network, which was integrated with RealSystem G2 in 1999, was used to stream live events. *E.g.*, RX-0230 (Sandpiper Adds RealSystem G2 to its CDN (August 4, 1999)) RESP-PA02644; RX-0231 (Sandpiper Networks Signs Partner Deals (October 7, 1999)) RESP-PA0263 (Sandpiper and RealSystem G2 integrated in 1999).

DISH argues that “Dr. Richardson’s analysis relies on his testing of RealPlayer 8, in which he did not stream a ‘live event video.’” Compl. Br. at 228 (quoting CX-0008C (Jeffay RWS) at Q/A 188). RealNetworks’ documentation, however, provides extensive disclosures of its capability to stream live event programming, including the availability of the functionality in the RealProducer application. RX-0001C (Richardson DWS) at Q/A 353, 355-56.

However, as I found above, RealPlayer does not disclose instructions for “streamlet request” or instructions to “place a streamlet request” because of the absence of disclosure regarding specific streamlets. *See supra* Sec. XIV.B.5.b)(1). Respondents have not shown that RealPlayer, with or without Hooper or Walker, renders obvious claim 16 of the ’554 patent, which recites, in part, “place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0002 (’554 patent) at claim 16. Similarly, claim 10 of the ’555 patent recites, in part, “place a streamlet request to the server over the one or more network

connections for the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0003 (’555 patent) at claim 10. Respondents have thus not shown that RealPlayer, with or without Hooper or Walker, renders obvious claim 10 of the ’555 patent or any of the asserted claims.

6. Secondary Considerations

Objective evidence of non-obviousness must always, when present, be considered en route to a determination of obviousness. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). This objective evidence, also known as “secondary considerations,” includes evidence of commercial success, long felt need, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006). Such evidence will not always dislodge a determination of obviousness based on analysis of the prior art. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 426 (2007) (commercial success did not alter conclusion of obviousness).

a) Nexus

For objective evidence of non-obviousness to hold weight, there must be a connection or nexus between the evidence and the claimed invention. The patentee must show that the objective evidence is tied to a specific product and that product is the invention disclosed and claimed in the patent. *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1329 (Fed. Cir. 2016).

Here, respondents argue that DISH is not entitled to a presumption of a nexus between its secondary considerations evidence and the claimed invention because DISH has failed to show that its product is coextensive with the patented invention. *See* Resps. Br. at 241-42. The Staff agrees that DISH is not entitled to the presumption of nexus because it has not shown that the

product “embodies the claimed features.” Staff Br. at 220 (quoting *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019)).

DISH argues that it is entitled to a presumption of nexus because the product it relies on, the Move Media Player, is “the invention disclosed and claimed” and is coextensive with the asserted claims. *See* Compls. Br. at 232-33 (quoting *Fox Factory*, 944 F.3d at 1373). The inventors listed on the asserted patents worked for a company called Move, which was later acquired by DISH. CX-0001C (Major DWS) Q/A 3, 13. DISH argues that respondents and the Staff have conceded that the Move Media Player embodies the claimed invention because those parties argued that public use of the Move Media Player in 2005 was an invalidating use meeting every element of the asserted claims. *See id.* at 233; *infra* Sec. XIV.C.

I find that the Move Media Player embodies the claimed invention. *See* Compls. Br. at 232-36; Resps. Br. at 232-41. Accordingly, DISH is entitled to a presumption that the commercial success of the Move system is due to the patented features of the invention. *WBIP*, 829 F.3d at 1329. To overcome that presumption, respondents must present “evidence that shows the proffered objective evidence was due to extraneous factors other than the patented invention.” *Id.* (cleaned up). “[A] patent challenger cannot successfully rebut the presumption with argument alone — it must present evidence.” *Id.*

Respondents have proffered the testimony of Dr. Richardson to rebut the presumption of nexus. *See* Resps. Br. at 242 (citing RX-0001C (Richardson DWS) at Q/A 471, 484-85, 467-69). Dr. Richardson testified that “there were advancements in compression and encoding technologies, protocols, server technologies, bandwidth available to consumers, consumer processor performance and memory and the quality of displays,” implying that those advancements, not the patented technology, explained the popularity of Move’s system. RX-0001C (Richardson DWS)

[REDACTED]

at Q/A 471. I find Dr. Richardson’s testimony on this point is conclusory and unsupported by other corroborating evidence. Accordingly, I give it little weight.

In contrast, Dr. Jeffay demonstrated through corroborating evidence that Move’s success is tied to the “unique characteristics of the claimed invention.” *See Fox Factory*, 944 F.3d at 1373-74. As Dr. Jeffay testified, the Move system was described as early as 2008 as offering “a smooth end user experience as the Move Media Player up-shifts and down-shifts in response to network and client CPU availability.” CX-0008C (Jeffay RWS) at Q/A 304 (quoting CX-1096C (Move Networks Tech Overview) at 19). Moreover, the Move Media Player’s encoding technique allowed streaming via HTTP, and the use of “[s]imple HTTP protocol transfer of media files from standard Web servers rather than deployment of expensive media servers’ reduces cost and complexity.” *Id.* at Q/A 324 (quoting CX-1096C at 22). DISH further adduced evidence demonstrating that the Move Media Player was recognized as superior in streaming performance relative to its competitors, rebutting respondents’ argument that “advancements in compression and encoding technologies,” etc. account for the Move Media Player’s success. *See* CX-1047C (Email 5.15.07); CX-0005C (Smith RWS) Q/A 10; JX-0063C (Mitchell Dep.) 87:16-88:19; 90:22-91:6.

In view of this record evidence, I find DISH is entitled to a presumption that there is a nexus between the objective evidence of non-obvious DISH proffers and the claimed invention. I find respondents have not rebutted that presumption.

b) Long-Felt But Unresolved Need and Failure of Others

Respondents argue that adaptive bitrate streaming was known and in use prior to the priority dates of the asserted patents. *See* Resps. Br. at 242 (citing RX-0001C (Richardson DWS) at Q/A 470-73). It is further argued that a significant number of other advances and well-known

solutions, such as RealNetworks or QuickTime, were available in the relevant timeframe. *See id.* The Staff agrees that DISH has not demonstrated long-felt but unresolved need nor failure of others because its contentions on the topic are overbroad. *See* Staff Br. at 220-21.

The record evidence demonstrates a long-felt but unresolved need for improved Internet streaming, and that others failed to provide the requisite streaming performance. RealNetworks broadcasts were “too choppy and too fuzzy, with a viewing window far too small to enjoy.” CX-1151 (Baseball Tests Online Broadcasts). Other streaming protocols at the time, like Adobe’s Flash, were “broken” even with “enough bandwidth.” CX-1047C (Email 5.15.07). Similarly, Microsoft had been working on adaptive streaming for years, but the record shows that customer Disney preferred Move’s Media Player over Microsoft’s Silverlight, which failed to natively adapt to network conditions. JX-0073C (Carper Dep.) at 26:5-16, 35:15-23, 36:24-37:14; CX-1050C (Email 11.26.07); JX-0062C (Major Dep.) at 186:10-188:7.

I thus find that DISH has demonstrated long-felt but unresolved need and failure of others.

c) Surprising Results

DISH argues that users expressed a substantial amount of surprise when they first experienced Move’s technology. *See* Compls. Br. at 237-38 (citing CX-0008C (Jeffay RWS) at Q/A 342-43). Move’s product was described as being “shockingly good,” JX-0021, and one user stated that he was “a bit shocked to come home one night and find Lost streaming across a 19” flat-screen computer monitor in crisp, clear glory,” JX-0023 (“Judging from the ABC site, the Move Networks stuff really works.”).

Respondents and the Staff argue that DISH has not presented evidence showing that the alleged surprising results are attributable to aspects of a particular product tied to the asserted patents as opposed to other factors. *See* Resps. Br. at 244; Staff Br. at 222. However, as discussed

[REDACTED]

above, I find that DISH has demonstrated a nexus between the Move Media Player and the asserted claims.

I find that DISH has adduced evidence demonstrating surprising results.

d) Commercial Success

DISH argues that the Move Media Player has exhibited substantial commercial success. *See* Compls. Br. at 238-41. By March 2008, viewership using Move Media Player rose to more than 34 million and users were averaging 50 minutes or more per session. CX-0008C (Jeffay RWS) at Q/A 357. By October 2008, both ESPN and ABC employed the Move Media Player to stream content on their websites. *See* CX-1105; CX-1132. In October 2010, [REDACTED] solicited a license to Move's ABR technology covered by the parent '783 application. CX-1061C. [REDACTED] invested in Move Networks in June 2007, CX-1071C, and DISH acquired Move in 2010, and used its technology to create Sling TV, a successful Internet streaming television platform, CX-0008C (Jeffay RWS) at Q/A 366. DISH has since licensed the asserted patents to [REDACTED] [REDACTED]s. JX-0034C; JX-0033C.

Respondents and the Staff argue that DISH has not presented evidence showing that the alleged commercial success of any product is attributable to the asserted patents as opposed to other factors. *See* Resps. Br. at 244; Staff Br. at 222. However, as discussed above, I find that DISH has demonstrated a nexus between the Move Media Player and the asserted claims.

I find that DISH has adduced evidence demonstrating commercial success.

e) Praise By Others

DISH argues that recognition and praise from users, content distributors, content providers, and industry-wide organizations confirm the non-obviousness of the asserted patents. *See* Compls.

Br. at 242-44 (citing CX-0008C (Jeffay RWS) at Q/A 369-73; CX-1134; CX-1105; CX-1125; CX--1113; CX-1047C; CX-1090; CX-1092).

Respondents and the Staff argue that DISH has not presented evidence tying to the praise to the claimed invention. *See* Resps. Br. at 244; Staff Br. at 222. However, as discussed above, I find that DISH has demonstrated a nexus between the Move Media Player and the asserted claims.

I find that DISH has adduced sufficient evidence demonstrating praise by others.

f) Copying

DISH argues that [REDACTED] is “very similar” to Move’s technology, *see* Compls. Br. at 241 (quoting JX-0069C (Ericson Dep.) 39:4-11), and that [REDACTED] also implemented ABR technology into [REDACTED] shortly after its [REDACTED], *see id.* It is argued that both [REDACTED] pitched their ABR technologies as providing nearly the exact same benefits as Move’s technology. *See id.*

Respondents argue that DISH has not adduced sufficient evidence that either [REDACTED] in fact copied DISH’s specific product. *See* Resps. Br. at 245. The Staff also argues that DISH did not provide direct evidence that [REDACTED], or another party, copied the inventions embodied in the asserted claims. *See* Staff Br. at 222-23.

I find that DISH has not adduced sufficient evidence showing “the replication of a specific product.” *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317, 1325 (Fed. Cir. 2004). DISH has provided no actual evidence of copying by [REDACTED] or any other entity. *See* RX-0001C (Richardson DWS) at Q/A 481.

I therefore find that DISH has not demonstrated copying.

g) Conclusion

Having considered the claimed invention, the prior art, the objective indicia of non-obviousness, and the record as a whole, I find that the objective indicia support a determination of non-obviousness. Thus, even if a hindsight combination of the prior art references identified by respondents would comprise every element of the claimed invention, I find that the objective evidence indicates a person of skill in the art at the time of the invention would not have found the invention to be obvious in view of those references.

C. Public Use

Respondents contend that Move publicly used its adaptive bitrate streaming technology to live stream a church event to a public audience over the Internet in October 2005, and that Move continued to use its adaptive bitrate streaming technology to livestream BYUtv channel content over the Internet until at least February 7, 2006. *See* Resps. Br. at 232. Respondents contend that claims 16, 17 and 20 of the '554 patent and claims 14 and 15 of the '555 patent are not entitled to a priority date before these admitted public uses. *See supra* Sec. XIV.A.

I found above that the '554 and '555 patent claims are entitled to the priority date established by the filing of U.S. Application No. 60/566,831, which is April 30, 2004. *See supra* Sec. XIV.A. Because the public use in question was well after that priority date, respondents' prior public use argument fails. Respondents have not shown by clear and convincing evidence that claims 16, 17 and 20 of the '554 patent and claims 14 and 15 of the '555 patent are invalid based on the alleged public use.

D. Inventorship

Respondents contend that named inventor Mark Hurst alone conceived of the virtual timeline concept claimed in the '554 patent. Resps. Br. at 249. DISH contends that Dave Brueck,

another listed inventor, also contributed to the virtual timeline concept. *See* Compls. Br. at 245-46. Respondents argue that the '554 and '555 patents are invalid for misjoinder of Mr. Brueck. *See* Resps. Br. at 247-50.

The evidence shows Mr. Brueck and Mr. Hurst jointly conceived the virtual timeline aspect of the invention and worked together to reduce it to practice. JX-0065C (Brueck Dep.) at 99:2-6. Mr. Brueck's contributions are corroborated by Mr. Major, who testified that the virtual timeline concept was "invented by Mark Hurst and Dave Brueck." JX-0062C (Major Dep.) at 123:4-5; CX-0001C (Major DWS) at Q/A 53. Indeed, Mr. Hurst's own testimony contradicts respondents' contention that Mr. Hurst alone invented virtual timelines. *See* JX-0084C (Hurst Dep.) at 48:5-10, 52:10-20 ("I believe [Mr. Brueck] contributed to ongoing development and expansion of the QVT capabilities.").

Respondents further argue that the '156, '564, and '555 patents are invalid for misjoinder of named inventor Mark Hurst. *See* Resps. Br. at 250-53. Respondents contend that "the claims in these patents were conceived in April 2003 – and Mr. Hurst did not work for Move until May 2003." *Id.* at 250. However, Mr. Major provided testimony contradicting respondents' contended facts, including testimony that Mr. Hurst was in fact hired in April 2003. *See* CX-0001C (Major DWS) at Q/A 39 ("[W]e had to have hired [Mr. Hurst] sometime in April 2003."). Moreover, Mr. Major further testified that Mr. Hurst "invented the algorithms and heuristics that determined when to upshift and when to downshift." JX-0062C (Major Dep.) at 200:10-19.

Respondents have not shown by clear and convincing evidence that Mr. Hurst is improperly named as an inventor on the '156, '564, and '555 patents.

E. Inequitable Conduct

1. Carmel and Related Materials

On September 15, 2010, Move received a notice of allowance for its continuation-in-part application, U.S. Pat. Appl. No. 11/673,483 (“the ’483 CIP Application”), which was set to issue on October 19, 2010. *See* JX-0031 (’483 CIP Application File History) at 67, 70. On October 12, 2010, third-party Microsoft sent a letter to Move discussing Carmel, which had not been disclosed, considered, or identified during prosecution of the ’483 CIP Application. *See* JX-0027C (Microsoft Letter); JX-0070C (Grange Dep.) 31:21-25. Microsoft’s letter included a “possible claim chart” comparing Carmel to the ’483 CIP Application claims. *See* JX-0027C at 4-7. On October 13, 2010, the day after receiving Microsoft’s letter, Move filed an Information Disclosure Statement (“IDS”) identifying the Carmel reference to the USPTO. *See* JX-0031 at 63-64.

On October 18, 2010, Move filed a continuation application, U.S. Application No. 12/906,940 (the “’940 Application”), wherein it included nearly identical independent claims copied from the ’483 CIP Application. *See* JX-0032 (’940 Application file history) at 2201. Carmel was included in an IDS filed concomitantly with the application. *See id.* at 2196. Move then filed preliminary amendment remarks on December 22, 2010, wherein it: (1) explained the circumstances of the IDS disclosure of Carmel in the ’483 CIP Application; (2) requested that the patentability of the independent claims copied from the ’483 CIP Application be assessed (claims 22 and 23); and (3) included approximately thirty pages of argument concerning how the claims were patentable over Carmel. *See id.* at 1128-68. The same examiner that handled the prosecution of the ’483 CIP Application handled the prosecution of the ’940 Application. *See* CX-0119 (’940 Application June 6, 2012, First OA); CX-1228 (’483 CIP Application Notice of Allowance).

Thereafter, Move received a Non-Final Office Action in the '940 Application allowing claims 22 and 23 after "[a] thorough review of the prior art." CX-0119 at 15-16.

Respondents argue that once Move received the Microsoft letter, Move knew it was required to withdraw the '483 CIP Application from issuance and file a request for continued examination ("RCE") in order for the examiner to consider Carmel before issuance. Resps. Br. at 255-57. Respondents further contend that filing the '940 Application and disclosing Carmel in that application demonstrates that Move believed Carmel to be material to the '483 CIP Application. *Id.*

To meet the clear and convincing evidence standard required to prove unenforceability due to inequitable conduct, respondents must show that "the single most reasonable inference able to be drawn from the evidence" is that the inventors intended to deceive the Patent Office. *Therasense*, 649 F.3d at 1290 (quoting *Star Scientific Inc. v. R.J. Reynolds Tobacco Co.*, 537 F.3d 1357, 1365 (Fed. Cir. 2008)). The weight of the evidence here does not meet that standard. It is undisputed that Move received the Microsoft letter within days of the expected issue date of the '483 CIP Application and took immediate action to submit the letter to the Patent Office. CX-1227 ('483 CIP Application IDS filed Oct. 13, 2010); JX-0032 ('940 Application file history) at 2201. Move also submitted Carmel in an IDS in U.S. App. No. 11/116,783 in accordance with 37 C.F.R. § 1.97(d). CX-1236. Whether or not other conduct, such as requesting the '483 CIP Application be withdrawn, would have been appropriate also, it is reasonable to infer that Move acted candidly after learning of Carmel. That defeats respondents' contention of intent to deceive. *See Therasense*, 649 F.3d at 1290-91.

Furthermore, above I found that Carmel neither anticipates nor renders obvious the asserted claims in this investigation. *See supra* Secs. XIV.B.1 and 3. As noted above, the examiner of the

[REDACTED]

'940 and '483 CIP Applications found claims 22 and 23 of the '483 CIP Application to be patentable over Carmel. *See* CX-0119 at 15-16. Respondents have not shown that Carmel is “but for” material to either the '940 or the '483 CIP Application. *See* CX-0008C (Jeffay RWS) at Q/A 268-73; *see also Therasense*, 649 F.3d at 1291-92.

Respondents argue that Move’s preliminary amendment in the '940 Application was an affirmative misrepresentation of the content of Carmel rising to the level of inequitable conduct. *See* Resps. Br. at 261-63. However, respondents do not dispute that the examiner had the Carmel reference. The examiner was under no obligation to accept Move’s interpretation of Carmel as true. *See* CX-0009C (Rea RWS) at Q/A 35-36. The record supports an inference that Move’s preliminary amendment comprised “legitimate attorney argument” regarding the distinctions of the claims over Carmel, rather than an affirmative misrepresentation of Carmel. *See Rothman v. Target Corp.*, 556 F.3d 1310, 1328-29 (Fed. Cir. 2009). Respondents therefore have not met the clear and convincing standard on that point either. *See Therasense*, 649 F.3d at 1291-93 (material misconduct from affirmative misrepresentations is usually limited to circumstances involving an “unmistakably false affidavit” or false testing data, which the examiner cannot independently verify).

Respondents further argue that the Microsoft Letter, including its claim charts, were material and never disclosed. *See* Resps. Br. at 263-65. However, the Microsoft Letter (including its claim charts) was cumulative of Carmel. JX-0027C (Microsoft Letter); CX-0008C (Jeffay RWS) at Q/A 285. Because Carmel itself is not “but for” material, a reference cumulative of Carmel cannot be “but for” material. *See Therasense*, 649 F.3d at 1291-93.

2. Public Use

Respondents additionally argue that Move's public use of its adaptive bitrate streaming technology in 2005 and 2006 also should have been disclosed to the Patent Office. *See* Resps. Br. at 266-67. But I have determined above that the public use of the invention in 2005 and 2006 was not before the priority date to which the claims were entitled. *See supra* Sec. XIV.C. Therefore, that prior use is not prior art and withholding it does not satisfy the "but for" materiality standard. *See Therasense*, 649 F.3d at 1291-92.

3. Conclusion

Respondents have not shown by clear and convincing evidence that the asserted claims are invalid based on inequitable conduct.

F. Eligibility Under 35 U.S.C. § 101

Respondents contend that all of the asserted claims of all of the asserted patents are directed to ineligible subject matter under § 101 of the Patent Act.

Section 101 of the Patent Act permits patenting of "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. Prohibited, however, are patents claiming "[l]aws of nature, natural phenomena, and abstract ideas" because they "are basic tools of scientific and technological work." *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012). While these narrow exceptions to the broad scope of patentability are necessary to "promote the progress of science and useful arts," as stated in Art. I., Sec. 8, Cl. 8, of the U.S. Constitution, "too broad an interpretation of this exclusionary principle could eviscerate patent law." *Mayo*, 566 U.S. at 70. Caution in an analysis under § 101 is warranted because "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Id.*

To determine whether a patent’s claims fall within one of the narrow exemptions to patentability, courts must engage in a two-step inquiry. First, the court must “determine whether the claims at issue are directed to one of those patent-ineligible concepts.” *Alice Corp. Pty. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014). If not, the inquiry ends, and the claims are not directed to ineligible subject-matter under § 101. *Id.* This inquiry “focus[es] on the language of the Asserted Claims themselves . . . considered in light of the specification.” *See TecSec, Inc. v. Adobe Inc.*, 978 F.3d 1278, 1292 (Fed. Cir. 2020) (cleaned up).

Only if one or more claims are found to be directed to a patent-ineligible concept does the inquiry then turn to the second step: examination of the elements of each claim “both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the claim’ into a patent-eligible application.” *Alice*, 573 U.S. at 217 (quoting *Mayo*, 566 U.S. at 79). A patent is directed to ineligible subject-matter only if it fails both steps. *See id.*

a) The ’564 and ’156 Patents

(1) Alice Step One

Respondents argue that the asserted claims of the ’564 and ’156 patents are directed to the abstract idea of “delivering content at different quality levels based on network availability.” Resps. Br. at 279.

In *Free Stream*, the Federal Circuit emphasized that Alice Step 1 requires examination of “whether the claims in the patent focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery.” *Free Stream Media Corp. v. Alphonso Inc.*, 996 F.3d 1355, 1363 (Fed. Cir. 2021) (quoting *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d

1299, 1314 (Fed. Cir. 2016)). Thus, *Alice* Step 1 requires me to focus on the words of the claims to determine if they are “directed to a result or effect.”

Claim 1 of the ’564 patent states:

1. An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,

wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,

wherein each of the files yields a different portion of the video on playback,

wherein the files across the different copies yield the same portions of the video on playback, and

wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and

wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,

the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher

quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and

presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

JX-0001 ('564 patent) at claim 1. Respondents identify claim 1 of the '564 patent as representative of the asserted and domestic industry claims in the '564 and '156 patents. Respondents concede other asserted claims of the '564 and '156 patents do not differ materially for the purposes of this analysis.

On their face, the claims of the '564 and '156 patents recite specific actions performed by the inventive media player to provide improved video streaming. The claims describe a definite environment in which the invention operates, which includes a video server and a network. The claims do not merely claim a desired result.

Respondents argue that the asserted claims of the '564 and '156 patents are directed to the “patent-ineligible abstract idea of delivering content at different quality levels based on network availability.” Resps. Br. at 279. However, the claimed end user station of the '564 patent requests portions of video content, where those portions are created by segmenting a complete video into multiple different bitrate portions to create streamlets with equal durations and time indexes. The playback of those streamlets on the end user station is repeatedly adjusted to higher or lower bitrate streamlets according to a factor that accounts for changing network conditions. *See generally, Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1305 (Fed. Cir. 2018) (holding that claims did not recite an abstract idea where they “employ[ed] a new kind of file that enables a computer security system to do things it could not do before.”).

[REDACTED]

The claimed apparatus of the '156 patent similarly requests sequential streamlets from the video server according to the playback times of the streamlets, which are also segmented from the content file into multiple bitrate portions, and playback of those streamlets on the end user station is similarly adjusted to higher or lower bitrate streamlets according to a factor that accounts for changing network conditions. These claims go beyond claiming the general concept of streaming, and even the general concept of adaptive bitrate streaming; they are an improvement on earlier streaming systems. *See Alice*, 573 U.S. at 217 (claims patent-eligible as a matter of law if “they improve an existing technological process”).

The specification provides further evidence that this claimed system is a significant departure and improvement over then-existing computer functionality. For example, the specification explains how prior streaming implementations, such as “progressive downloads,” did not fully support functionalities like rewind, fast forward, and direct seek during streaming, and were vulnerable to network failures or congestion.” *See JX-0001* ('564 patent) at 2:1-22. The specification further explains how the claimed adaptive bitrate streaming offered improvements to existing problems with streaming reliability, efficiency, and latency, such that users could enjoy to enable more reliable and continuous streaming. *See id.* at 2:25-57; CX-0008C (Jeffay RWS) at Q/A 243 (explaining how the '564 and '156 patents provided improvements concerning reliability, efficiency, and latency). Thus, the '564 and '156 patents specifically purport to improve user content streaming to overcome problems existing from prior streaming solutions. *See Uniloc USA, Inc. v. LG Elecs. USA, Inc.*, 957 F.3d 1303, 1307 (Fed. Cir. 2020) (reversing section 101 ineligibility holding because “the claims at issue are directed to a patent-eligible improvement to computer functionality, namely the reduction of latency experienced by parked secondary stations in communication systems.”); *Packet Intel. LLC v. NetScout Sys., Inc.*, 965 F.3d 1299, 1309 (Fed.

Cir. 2020) (finding claims patent-eligible because they “meet a challenge unique to computer networks, identifying disjointed connection flows in a network environment”).

Respondents have not shown that the asserted claims of the of the ’564 and ’156 patents are directed to an abstract idea. Consideration of step two of *Alice* is therefore unnecessary because the claims are not directed to ineligible subject-matter. *Alice*, 573 U.S. at 216.

(2) *Alice* Step Two

Even had respondents shown that the asserted claims of the of the ’564 and ’156 patents were directed to abstract ideas, the particular arrangements of claimed elements demonstrate the claims are directed to eligible subject matter under step two of *Alice*. In particular, the asserted claims of the ’564 and ’156 patents are directed toward improvements in adaptive bitrate streaming that include partitioning/segmenting the content file and making successive determinations as to whether to change the stream quality based on network conditions. *See Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350 (Fed. Cir. 2016) (the patent-eligible inventive concept identified was “the installation of a filtering tool at a specific location, remote from the end-users, with customizable filtering features specific to each end user. This design gives the filtering tool both the benefits of a filter on a local computer and the benefits of a filter on the ISP server.”).

As the patents themselves confirm, conventional streaming encounters three basic challenges with regard to data transport over a network such as the Internet: reliability, efficiency, and latency. *See* JX-0001 (’564 patent) and JX-0004 (’156 patent) at 2:16-60. Addressing these issues, the claims are purportedly directed to a specific end user station and apparatus designed to implement a specific solution to known problems with streaming content over the Internet, which includes delivering streaming content using adaptive bitrate streaming by segmenting the content

file into streamlets to permit seamless transitions between different bitrates and shifting control of switching between the bitrates to the client from the server. *See* CX-0008C (Jeffay RWS) at Q/A 246; JX-0001 ('564 patent) at claim 1; JX-0004 ('156 patent) at claim 1.

(3) Conclusion

Accordingly, respondents have not demonstrated that the asserted claims of the '564 and '156 patents are directed toward ineligible subject matter.

b) The '554 and '555 Patents

(1) *Alice* Step One

Respondents have not shown that the asserted claims of the '554 and '555 patents are directed to an abstract idea, devoid of a concrete or tangible application. Rather, the asserted claims are directed to technical improvements in video streaming. *See Alice*, 573 U.S. at 223 (“[T]he claims in [*Diamond v. Diehr*, 450 U.S. 175, 188 (1981)] were patent eligible because they improved an existing technological process, not because they were implemented on a computer.”).

Respondents contend that the asserted claims of the '554 and '555 patents are “directed to the similar patent-ineligible abstract idea of delivering content at different speeds based on network availability.” Resps. Br. at 282. Yet, the asserted claims of the '554 and '555 patents provide a concrete solution to a problem in the form of partitioning the content file to permit seamless transitions between different bitrates and shifting control of switching between the bitrates to the client from the server. *See* CX-0008C (Jeffay RWS) at Q/A 255. The inventions in the '554 and '555 patents improve the functionality of a communication network used to provide digital media services like video streaming—they are an improvement on earlier streaming systems. The specifications of the '554 and '555 patents explain that “three basic challenges exist with regard to data transport streaming over a network such as the Internet that has a varying amount of data

loss.” JX-0002 (’554 patent) at 2:23-25; JX-0003 (’555 patent) at 2:23-25. These disclosures show that the claims recite technical solutions to then-existing technical problems.

The claimed end user station and content player device “provide an apparatus, system, and method for adaptive-rate content streaming that overcome many or all of the above-discussed shortcomings in the art.” JX-0002 (’554 patent) at 3:8-10; JX-0003 (’555 patent) at 3:8-10. Respondents have not shown that the asserted claims of the of the ’554 and ’555 patents are directed to an abstract idea, devoid of a concrete or tangible application. Consideration of step two of *Alice* is therefore unnecessary because the claims are not directed to ineligible subject-matter.

(2) *Alice* Step Two

Even if respondents had met their burden of showing that the asserted claims of the ’554 and ’555 patents were directed to abstract ideas, the particular arrangements of elements in the asserted claims demonstrate the claims are directed to eligible subject matter under step two of *Alice*. In particular, the asserted claims of the ’554 and ’555 patents are be directed toward specific apparatuses for delivering streaming content using adaptive bitrate streaming wherein the content file is segmented into streamlets and shifting control of switching between the bitrates to the client from the server. *See Bascom*, 827 F.3d at 1350 (the patent-eligible inventive concept identified was “the installation of a filtering tool at a specific location, remote from the end-users, with customizable filtering features specific to each end user. This design gives the filtering tool both the benefits of a filter on a local computer and the benefits of a filter on the ISP server.”).

As the patents themselves confirm, conventional streaming encounters three basic challenges with regard to data transport over a network such as the Internet: reliability, efficiency, and latency. *See* JX-0002 (’554 patent) and JX-0003 (’555 patent) at 2:23-67. Addressing these

issues, the claims are directed to a specific end user station and apparatus designed to implement a specific solution to known problems with streaming content over the Internet, which includes delivering streaming content using adaptive bitrate streaming by segmenting the content file into streamlets to permit seamless transitions between different bitrates and shifting control of switching between the bitrates to the client from the server. *See* CX-0008C (Jeffay RWS) at Q/A 255; JX-0002 ('554 patent) at claim 16; JX-0003 ('555 patent) at claim 10.

(3) Conclusion

Respondents have not demonstrated that the asserted claims of the '554 and '555 patents are directed toward ineligible subject matter.

XV. ECONOMIC PRONG OF THE DOMESTIC INDUSTRY REQUIREMENT

For a patent-based complaint, a violation of section 337 can be found “only if an industry in the United States, relating to the articles protected by the patent . . . exists or is in the process of being established.” 19 U.S.C. § 1337(a)(2). The complainant bears the burden of establishing that the domestic industry requirement is satisfied. *John Mezzalingua Assocs., Inc. v. Int’l Trade Comm’n*, 660 F.3d 1322, 1331 (Fed. Cir. 2011).

Section 337(a)(3) sets forth the following economic criteria for determining whether the economic prong of the domestic industry requirement is satisfied in such investigations:

[A]n industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned –

- (A) significant investment in plant and equipment;
- (B) significant employment of labor or capital; or
- (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3). Given that these criteria are listed in the disjunctive, satisfaction of any one of them will be sufficient to meet the economic prong of the domestic industry requirement. *See Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm’n Op. at 25, USITC Pub. No. 4289 (Nov. 2011).

The establishment of the “economic prong” is not dependent on any “minimum monetary expenditure” and there is no need for the complainant “to define the industry itself in absolute mathematical terms.” *Certain Stringed Musical Instruments and Components Thereof* (“*Stringed Instruments*”), Inv. No. 337-TA-586, Comm’n Op. at 25-26 (May 16, 2008). The Commission has clarified that investments in plant and equipment, labor, and capital that may fairly be considered investments in research and development under subsection (C) are eligible for consideration under subsections (A) and (B) as well. *Certain Solid State Storage Drives, Stacked Electronics Components, and Products Containing Same*, Inv. No. 337-TA-1097, Comm’n Op. at 14 (June 29, 2018).

As for accounting and allocations, the complainant need not provide a “precise accounting” of its investments to determine their numerical value, “as most people do not document their daily affairs in contemplation of possible litigation.” *Stringed Instruments*, Inv. No. 337-TA-586, Comm’n Op. at 15. Reasonable and appropriate allocation methodologies, such as sales-based allocations, have been employed and accepted by the Commission to satisfy the domestic industry economic prong. *See Certain Marine Sonar Imaging Devices, Including Downscan and Sidescan Devices, Products Containing the Same, and Components Thereof*, Inv. No. 337-TA-921, Comm’n Op. at 61-62 (approving use of weighted sales-based allocation to arrive at investment amounts) (Jan. 6, 2016).

[REDACTED]

DISH argues that it has satisfied the economic prong of the domestic industry requirement of section 337(a)(3)(A)-(C) through significant investment in plant and equipment, as well as labor and capital, with respect to the articles protected by the asserted patents, and substantial investment in exploitation of the asserted patents. *See* Compls. Br. at 269-96. Respondents oppose any such findings. *See* Resps. Br. at 283-94. The Staff argues that DISH has satisfied the economic prong of the domestic industry requirement under subsections (A) and (B), but not subsection (C). *See* Staff Br. at 247-78. For the reasons below, I find that DISH satisfies the economic prong of the domestic industry requirement.

A. Findings of Fact Relating to the Domestic Industry

DISH identifies [REDACTED] U.S. facilities that are purportedly used to research, design, develop, remanufacture, market, sell, and support the relevant products and services:

[REDACTED]

Together, these [REDACTED] facilities add up to approximately [REDACTED] square feet. *See* CX-0002C (Kroonenberg DWS) at Q/A 31. DISH further employs approximately [REDACTED] full-time employees and approximately [REDACTED] contract employees at these facilities who install, repair, and replace DISH Set-Top Boxes; operate and maintain servers and other equipment; and provide technical customer support and other activities. *See* CX-0016C (DISH Headcount); CX-0002C (Kroonenberg DWS) at Q/A 32.

Respondents argue that DISH’s domestic industry calculations are flawed because DISH relies on “Covered Servers”²⁷ in its analysis without sufficiently tying the Covered Servers to the asserted patents.

DISH argues that it is entitled to rely on the Covered Servers because it could not exploit the technology of the asserted patents without the Covered Servers, and thus these servers are “necessary to bring the patented technology to the consumer market.” *Compls. Br.* at 272 (quoting *Certain Magnetic Tape Cartridges and Components Thereof* (“*Magnetic Tape Cartridges*”), Inv. No. 337-TA-1058, Comm’n Op. at 56 (Apr. 9, 2019)). It is argued that the proprietary nature of DISH’s technology renders them incompatible with other systems, and that DISH’s investments in critical, non-patented products and services, such as “compression and decompression technologies,” should likewise be credited toward DISH’s domestic industry here. *See id.* at 273-74.

²⁷ The DISH Covered Servers include DISH’s Streamlet Servers, Media Servers, and CDN Servers. *See* CX-0010 (Negus DWS) at Q/A 673; CX-0003C (Marshall DWS) at Q/A 28-30; CX-0529C. DISH’s Streamlet Servers and Media Servers are located in [REDACTED], *see* CX-0003C (Marshall DWS) at Q/A 29-30, while DISH’s CDN Servers are located throughout the United States, *see id.* at Q/A 28.

[REDACTED]

The Staff agrees with DISH that the Covered Servers should be included in the claimed domestic industry because the Covered Servers are essential components that enable the exploitation of the patented technology, and the claimed end user products cannot alone implement the claimed streaming technology without the Covered Servers. *See* Staff Br. at 256-58.

Customers cannot use DISH's Set-Top Boxes or Amazon Fire App without the Covered Servers. As Mr. Kroonenberg testified, [REDACTED]

[REDACTED]

[REDACTED] CX-0002C (Kroonenberg DWS) at Q/A 54. The claims themselves directly implicate the Covered Servers with reference to server content "encoded," "stored," and "accessed." *Id.* at Q/A 53; CX-0986C (System Architecture); CX-0003C (Marshall DWS) at Q/A 31.

Respondents argue that the Covered Servers "could be substituted for commercially available third-party CDN services." *Resps. Br.* at 286. However, this argument implicitly recognizes that at least a server of some sort is a necessary component to exploit the patented inventions and should be credited for DISH's domestic industry. Moreover, Mr. Marshall testified as to the proprietary nature of DISH's software and also confirmed that these servers are "critical" to implementing this technology:

[REDACTED]

Based on the record evidence discussed above, I find that the Covered Servers are necessary to exploit the patented technology. The Commission has found investments in articles

[REDACTED]

that do not themselves practice the patent can contribute to the domestic industry where those investments were “central to enabling” exploitation of the article covered by the patented claims. *See, e.g., Magnetic Tape Cartridges*, Comm’n Op. at 47-57.

For the reasons stated above, I include DISH’s investments related to the Covered Servers in my analysis of DISH’s domestic industry.

B. DISH’s Allocation Methodology

Respondents argue that DISH’s allocation methodology is flawed because, with regard to the Set-Top Boxes, DISH did not proportion DISH customer usage between satellite and Internet streaming. *See Resps. Br.* at 288-89. Because the claims cover only Internet streaming, respondents contend that complainant’s expert Dr. Vander Veen provided an unreliable allocation. *See id.*

DISH argues that its allocation methodology is reasonable because all asserted claims are apparatus claims, and DISH captures whether the Set-Top Boxes are used for Internet streaming each month. *See Compls. Br.* at 274-75. The Staff agrees that Dr. Vander Veen’s methodology is reasonable and fact-based and argues that a DISH Set-Top Box “is an article protected by the Asserted Patents” if it has been used even once with the patented technology. *Staff Br.* at 261.

I find that DISH’s usage-based allocation is reasonable. DISH’s allocation methodology is based on the average percentages of total DISH Set-Top Boxes that are used to stream content using the patented ABR technology each month, from 2016 through June 2021, and DISH tracks this type of usage as part of its ordinary course of business. *See CX-0002C (Kroonenberg DWS)* at Q/A 23. DISH’s allocation methodology is therefore “appropriate to [its] circumstances” and “supported by the evidence in the record.” *Certain Mobile Device Holders and Components Thereof*, Inv. No. 337-TA-1028, Comm’n Op. at 18 (Mar. 22, 2018).

[REDACTED]

Using this allocation methodology, DISH captured individual instances of practicing the asserted patents by tracking number of the Set-Top Box in a particular month. *See* CX-0002C (Kroonenberg DWS) at Q/A 23). This data shows that the average percentages of the Set-Top Boxes used to stream content by practicing the asserted claims each month from 2016 through June 2021 were as follows:

[REDACTED]

DISH argues that that no allocation is required with respect to the Sling TV Apps, because these are 100% Internet-based streaming (*i.e.*, there is no satellite-based alternative service). Compls. Br. at 275-76. That said, Dr. Vander Veen did offer two alternative allocation methodologies accordingly to the monthly usage rate of Sling TV Apps by platform. *See id.* His first alternative allocation methodology aggregates the monthly usage percentage of Sling TV Apps for the three claimed domestic industry platforms, Amazon, iOS, and Roku, “if it were determined that DISH could only rely on those platforms to satisfy Section 337(a)(3).” *Id.* at 276. Dr. Vander Veen’s second alternative allocation methodology accounts for the monthly usage rate of only the Sling Fire App, “if it were determined that DISH could only rely on the Amazon platform to satisfy Section 337(a)(3).” *Id.* Respondents do not dispute whether Dr. Vander Veen should have allocated DISH’s investments by asserted patent. *See* Resps. Br. at 283-94.

I find that Dr. Vander Veen’s allocation methodology accounting for the monthly usage rate of only Sling Fire App is appropriate. As I found above, DISH has not shown that the Sling

[REDACTED]

Fire App is representative of the Sling TV Apps for iOS and Roku. *See supra* Sec. VIII.B. Thus, the claimed investments relating to Sling TV should be allocated according to the following methodology:

[REDACTED]

C. DISH's Investments in Plant and Equipment

I find that DISH has demonstrated [REDACTED] in plant and equipment expenses with respect to articles protected by the asserted patents. DISH's plant and equipment investments are comprised of five categories: (1) buildings, land, and improvements; (2) furniture, fixtures, and equipment; (3) rent, utilities, and maintenance; (4) leased equipment; and (5) payments to third party CDNs. *See* Compls. Br. at 276-82.

1. Buildings, Land, and Improvements

DISH maintains U.S. facilities in [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] *See* CX-0002C (Kroonenberg DWS) at Q/A 33-40.

These facilities includes DISH's headquarters, digital broadcast and data centers, facilities where

[REDACTED]

DISH Set-Top Boxes, IT facilities, customer call centers, and warehouse and distribution centers.

See id.

[REDACTED]

[REDACTED]

As of June 30, 2021, DISH's net book value of the buildings, land, and improvements associated with the identified facilities were [REDACTED] for DISH TV and [REDACTED] for Sling TV. CX-0029C (Buildings, Land, and Improvements).

[REDACTED]

When the corresponding investments in DISH TV and Sling TV are allocated as described above, the net book value of buildings, land, and improvements allocable to the asserted patents is: [REDACTED] for Engineering/R&D, [REDACTED] for Manufacturing/Distribution, [REDACTED] for Broadcast/Data Centers, and [REDACTED] for Installation. CX-0007C (Vander Veen DWS) at Q/A 40.

2. Furniture, Fixtures, and Equipment

DISH's U.S. facilities include servers and other equipment associated with providing streaming content, and these investments play a direct role in delivering the claimed technology to consumers. *See* CX-0986C (System Architecture); CX-0003C (Marshall DWS) at Q/A 17, 28-30. DISH's data centers in [REDACTED] house equipment needed to prevent service interruptions, such as generators and battery packs. *See* CX-0002C (Kroonenberg

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[REDACTED]

DWS) at Q/A 53 ([REDACTED]

[REDACTED]).

[REDACTED]

As of June 30, 2021, DISH's net book value of the furniture, fixtures, and equipment within DISH's identified U.S. facilities were [REDACTED] for DISH TV and [REDACTED] for Sling TV. CX-0031C (Furniture, Fixtures, and Equipment).

[REDACTED]

[REDACTED]

[REDACTED]

When the corresponding investments in DISH TV and Sling TV are allocated as described above, the net book value of furniture, fixtures, and equipment allocable to the asserted patents is:

[REDACTED]

3. Rent, Utilities, and Maintenance

DISH's rent, utilities, and maintenance for DISH's identified U.S. facilities were [REDACTED] in 2016, [REDACTED] in 2017, [REDACTED] in 2018, [REDACTED] in 2019, [REDACTED] in 2020, and [REDACTED] through June 2021. CX-0018C (Rent, Utilities, and Maintenance); CX-0030C (Rent, Utilities, and Maintenance).

[REDACTED]

[REDACTED]

When the corresponding investments in DISH TV are allocated as described above, the net book value of rent, utilities, and maintenance allocable to the asserted patents is:

[REDACTED]

With respect to Sling TV, DISH's rent, utilities, and maintenance for DISH's identified U.S. facilities were [REDACTED] in 2016, [REDACTED] in 2017, [REDACTED] in 2018, [REDACTED] in 2019, [REDACTED] in 2020, and [REDACTED] through June 2021. CX-0018C (Rent, Utilities, and Maintenance); CX-0030C (Rent, Utilities, and Maintenance).

[REDACTED]

[REDACTED]

CX-0030C (Rent, Utilities, and Maintenance) at 6.

When the corresponding investments in Sling TV are allocated as described above, the net book value of rent, utilities, and maintenance allocable to the asserted patents is:

[REDACTED]

CX-0007C (Vander Veen DWS) at Q/A 45.

4. Leased Equipment

DISH TV services are only available to customers that lease or own certain proprietary equipment from DISH. *See* CX-0003C (Marshall DWS) at Q/A 34, 48. The net book value of the equipment that was leased to customers in the United States totaled [REDACTED] as of June 30, 2021. CX-0032C (Leased Equipment).

[REDACTED]

CX-0032C (Leased Equipment) at 1.

The Set-Top Boxes comprises approximately [REDACTED] of the total cost of this equipment, and of these Set-Top Boxes, [REDACTED] were Set-Top Boxes that practice the asserted patents as of 2021, CX-0007C (Vander Veen DWS) at Q/A 33. Combining these two percentages, in turn, shows that [REDACTED] of the value of the equipment owned or leased by DISH TV customers, or [REDACTED] was attributable to leased Set-Top Boxes that practice the asserted patents. *See id.* at Q/A 33, 47.

[REDACTED]

CDX-0007C (Vander Veen Demonstratives) at 36.

Respondents argue that Dr. Vander Veen's analysis overvalues the Set-Top Boxes as a portion of the net book value of leased equipment. *See* Resps. Br. at 293. Respondents rely on Ms. Mulhern's critique that Dr. Vander Veen's "methodology fails to account for evidence that Set-Top Boxes have a shorter useful life than other leased equipment." RX-0005C (Mulhern RWS) at Q/A 72. However, DISH argues that it only considers the depreciated value of its equipment. Compls. Reply Br. at 89. I find that respondents have not adduced sufficient evidence

[REDACTED]

rebutting Dr. Vander Veen's analysis. Ms. Mulhern cites generalized articles, *see* RX-0005C (Mulhern RWS) at Q/A 73, and it has not been shown that Dr. Vander Veen's analysis is unreliable.

5. Third-Party CDN Servers

DISH seeks to include payments to third parties to host Covered CDN Servers in the United States as part of its domestic industry investments. CX-0003C (Marshall DWS) at Q/A 28. I need not resolve whether these payments should be considered part of DISH's domestic industry because, as noted below, DISH's domestic industry investments are significant even when these payments are excluded.

6. Total Allocated Investments in Plant and Equipment

As discussed above, the evidence shows that DISH's Sling TV investments should be allocated according to the Sling TV App for Amazon methodology. Likewise, the investments based on payments to third-party CDNs should be excluded. Thus, using the Amazon Only allocation methodology, and also deducting payments to third-party CDNs, the evidence shows that DISH's claimed investments in plant and equipment should be reduced accordingly.

As discussed above, the net book value of buildings, land, and improvements allocable to the asserted patents is: [REDACTED] for Engineering/R&D, [REDACTED] for Manufacturing/Distribution, [REDACTED] for Broadcast/Data Centers, and [REDACTED] for Installation. *See supra* Sec. XV.C.1. This sums to [REDACTED]. Likewise, the net book value of furniture, fixtures, and equipment allocable to the asserted patents is: [REDACTED] for Engineering/R&D, [REDACTED] for Manufacturing/Distribution, [REDACTED] for Broadcast/Data Centers, and [REDACTED] for Installation. *See supra* Sec. XV.C.2. The sum total here is [REDACTED].

For rent, utilities, and maintenance, the following table is based on the calculations discussed above in Sec. XV.C.3. As DISH can only show representativeness of the DISH Set-Top

[REDACTED]

Boxes after December 2017, *see supra* Sec. VIII.A, DISH cannot be credited for the investments made in DISH TV prior to 2018.

[REDACTED]

Finally, the net bulk value of DISH's leased equipment is [REDACTED]. *See supra* Sec. XV.C.4.

The total amount of allocated investments in plant and equipment thus attributable to articles protected by the asserted patents is [REDACTED].²⁸

D. DISH'S Investments in Labor and Capital

I find that DISH has demonstrated [REDACTED] in labor and capital expenses with respect to articles protected by the asserted patents.

1. Salaries and Benefits

DISH employs approximately [REDACTED] full-time employees and approximately [REDACTED] contract employees at its the [REDACTED] facilities that support DISH TV and Sling TV operations. *See* CX-0002C (Kroonenberg DWS) at Q/A 32; CX-0016C (DISH headcount).

As of June 30, 2021, DISH paid its domestic employees working on DISH TV [REDACTED] in 2016, [REDACTED] in 2017, [REDACTED] in 2018, [REDACTED] in 2019, [REDACTED]

²⁸ DISH argues that its sales and marketing expenses should be credited as well because it is more than a mere importer. *See* Compls. Br. at 283-84. Respondents contend that such expenditures should be excluded from the domestic industry investments. *See* Resps. Br. at 293-94. I need not reach this issue because DISH's total investments in plant and equipment are significant and substantial irrespective of its sales and marketing expenditures. *See infra* Sec. XV.F. However, if such expenditures are considered, DISH's total investments in plant and equipment exceed [REDACTED]. *See* CX-0007C (Vander Veen DWS) at Q/A 52.

[REDACTED]

[REDACTED] in 2020, and [REDACTED] through June 2021. CX-0020C (Salaries and Benefits);
CX-0033C (Salaries and Benefits).

[REDACTED]

CX-0033C (Salaries and Benefits) at 3.

[REDACTED]

CDX-0007C (Vander Veen Demonstratives) at 71.

[REDACTED]

When the corresponding investments in DISH TV are allocated as described above, the net salaries and benefits allocable to the asserted patents is:

[REDACTED]

CX-0007C (Vander Veen DWS) at Q/A 56.

For Sling TV, the salaries and benefits DISH paid its domestic employees totaled [REDACTED] in 2016, [REDACTED] in 2017, [REDACTED] in 2018, [REDACTED] in 2019, [REDACTED] in 2020, and [REDACTED] through June 2021. CX-0020C (Salaries and Benefits); CX-0033C (Salaries and Benefits).

[REDACTED]

CX-0033C (Salaries and Benefits) at 5.

[REDACTED]

[REDACTED]

CDX-0007C (Vander Veen Demonstratives) at 73.

When the corresponding investments in Sling TV are allocated as described above, the net salaries and benefits allocable to the asserted patents is:

[REDACTED]

CX-0007C (Vander Veen DWS) at Q/A 56.

2. Total Allocated Investments in Labor and Capital

As discussed above, the evidence shows that DISH's Sling TV investments should be allocated according to the Sling TV App for Amazon methodology, and that DISH can only show representativeness of the DISH Set-Top Boxes after December 2017. *See supra* Secs. VIII.A and B. Hence, the evidence shows that DISH's claimed investments in engineering, R&D, manufacturing, distribution, broadcast/data, and installation activities are summarized in the following table:

[REDACTED]

[REDACTED]

CX-0007C (Vander Veen DWS) at Q/A 63.²⁹

E. DISH’S Investments in Exploiting the Asserted Patents

DISH contends that its subsection (C) investments include: (1) DISH’s acquisition of Move’s assets in 2010, which included [REDACTED] of in-progress R&D for the patented ABR technology; and (2) [REDACTED] on R&D directed to the patented ABR technology from 2018 through June 2021, as summarized in the following table:

[REDACTED TABLE]

CX-0037C (Move Networks R&D). DISH thus contends it has invested at least [REDACTED] in R&D that is allocable to the asserted patents. *See* Compls. Br. at 291.

DISH argues there is a nexus between these R&D expenses and the asserted patents because each of these investments was in the patented adaptive bitrate streaming technology, and this technology is and always has been Move’s business. *See* Compls. Br. at 290-91.

²⁹ DISH argues that its sales and marketing expenses should be credited as well because it is more than a mere importer. *See* Compls. Br. at 289-90. Respondents contend that such expenditures should be excluded from the domestic industry investments. *See* Resps. Br. at 293-94. I need not reach this issue because DISH’s total investments in labor and capital are significant and substantial irrespective of its sales and marketing expenditures. *See infra* Sec. XV.F. However, if such expenditures are considered, DISH’s total investments in labor and capital exceed [REDACTED]. *See* CX-0007C (Vander Veen DWS) at Q/A 64-65.

I need not determine whether DISH satisfies the domestic industry requirement under prong (C) of the statute because, as explained below, I find that a domestic industry exists under prongs (A) and (B).

F. Significance Analysis

I find that DISH's investments of [REDACTED] in plant and equipment expenses with respect to articles protected by the asserted patents are qualitatively and quantitatively significant under 19 U.S.C. § 1337(a)(1)(A). I find that DISH's investments of [REDACTED] in labor and capital expenses with respect to articles protected by the asserted patents are qualitatively and quantitatively significant under 19 U.S.C. § 1337(a)(1)(B).

All of DISH's "principal properties" are located in the United States. CX-0044 (2020 Annual Report) at 43. With respect to plant and equipment, for example, DISH's properly allocated domestic expenditures are [REDACTED] larger in comparison compared to DISH's total foreign investments of in buildings, land, rent, utilities, taxes, furniture, and fixtures over the same time period. *See* CX-0007C (Vander Veen DWS) at Q/A 78; CX-0036C (DISH's Foreign Investments). Similarly, with respect to labor or capital, DISH's total properly allocated domestic investments in salaries and benefits of is larger than DISH's total foreign investments in salaries and benefits from over the same time period. *See id.* Indeed, over [REDACTED] % of DISH's workforce is located in the United States. *See* CX-0016C (DISH Headcount).

Moreover, DISH's evidence has appropriately demonstrated the nature and relative importance of its domestic activities to the Set-Top Boxes and Amazon Fire App in view of the relevant industry. *See Certain Male Prophylactic Devices*, Inv. No. 337-TA-546, Comm'n Op. at 45-46 (Aug. 1, 2007). Since 2017, between [REDACTED] % of DISH's remanufactured Set-Top Boxes have been remanufactured in the United States. CX-0059C (Set-Top Box Remanufacture).

Between [REDACTED] % of the DISH Set-Top Boxes in customer homes were remanufactured devices. CX-0007C (Vander Veen DWS) at Q/A 76 (citing CX-0024C (Set-Top Box Summary)). All of the infrastructure that is critical to implementing the patented adaptive bitrate technology on these set-top boxes is located in the United States. *See supra* Sec. XV.A. DISH TV operates within the multichannel video programming distributor market, while Sling TV operates within the virtual multichannel video programming distributor market, which is made up of service providers that deliver “over the top” services. CX-0007C (Vander Veen DWS) at Q/A 79. DISH TV consistently accounts for between [REDACTED] % of its market, while Sling TV accounts for between [REDACTED] % of its market. *See id.* at Q/A 80-81.

Respondents contend that DISH’s significance analysis is flawed for multiple reasons, including the limited role of streaming video in the DISH TV service, a failure to adequately consider the contribution of foreign investments in the manufacturing of the DISH Set-Top Boxes, and a failure to consider the importance of DISH Anywhere to DISH streaming video services. *See Resps. Br.* at 290-91 (citing RX-0005C (Mulhern RWS) Q/A 76-84).

As to the limited role of streaming as a total portion of DISH’s costs and expenses, the fact that DISH’s company-wide costs were much greater than the claimed domestic expenditures does not defeat the significance of DISH’s domestic industry investments. *See Certain Mobile Electronic Devices, Including Wireless Communication Devices, Portable Music and Data Processing Devices, and Tablet Computers*, Inv. No. 337-TA-794, Comm’n Op. at 104 (July 5, 2013) (“The fact that Samsung’s total sales revenues in 2010 and 2011 were much greater than its domestic engineering and research and development expenses, as Apple argues, does not negate the fact that Samsung has invested millions of dollars domestically relating to protected articles.”). Respondents contend that DISH’s investments are not quantitatively significant because they total

only about █% of DISH's total costs and expenses. Resps. Br. at 290. However, the total size of a company relative to its investments in the articles protected by the patent does not negate the possibility that those investments are still "significant" and substantial." *See Carburetors* at 28 ("Significance is based on the marketplace conditions regarding the articles protected by the Asserted Patents. The fact that a complainant may have substantial sales of other products is not pertinent to this analysis.")).

As for the failure of DISH to consider the contribution of foreign investments in the manufacturing of the DISH Set-Top Boxes, there is "no indication in the language of subparagraph (A) or (B) that the foreign sourcing of equipment and materials defeats the inclusion of such equipment under subparagraphs (A) or (B) when the equipment and materials are located in the United States for continuous use in the United States." Compls. Reply Br. at 87-88 (quoting *Certain Concealed Cabinet Hinges and Mounting Plates*, Inv. No. 337-TA-289, ID, 1989 WL 608804, at *24-*25 (Sept. 28, 1989)). DISH's Set-Top Boxes are located in the United States for continuous use in the United States.

Regarding DISH Anywhere, it is argued that "DISH Anywhere is not a domestic industry product but does account for a growing portion of DISH's streaming offerings." Resps. Br. at 291. Yet, as Mr. Marshall testified, "You have to have a DISH TV account and those people with a Dish TV account will have a DISH set-top box" to use the DISH Anywhere website or app. CX-0003C (Marshall DWS) at Q/A 48. Dr. Vander Veen properly accounted for the usage of DISH Anywhere because all set-top boxes and all customer accounts are captured in the denominators of his allocations. *See* CX-0007C (Vander Veen DWS) at Q/A 37.

The Staff agrees that DISH has shown that its investments in plant and equipment and labor and capital are quantitatively and qualitatively significant under subsections (A) and (B). *See* Staff

Br. at 276-78. The Staff argues that DISH's properly allocated domestic expenditures in both plant and equipment and labor and capital are several times larger than its corresponding foreign investments in these categories. *See* Staff Br. at 277 (citing CX-0007C (Vander Veen DWS) at Q/A 78; CX-0036C (DISH's Foreign Investments)).

As explained above, DISH has demonstrated approximately [REDACTED] in qualifying expenses in plant and equipment under prong (A), and approximately [REDACTED] in labor and capital under prong (B) of the statute with respect to articles protected by the asserted patents. *See supra* Secs. XIV.C.6, XIV.D.2. DISH has also appropriately demonstrated that its domestic investments in plant and equipment, and in labor or capital, are quantitatively significant in comparison to the entirety of DISH's foreign investments across relevant categories.

Based on the record evidence discussed above, DISH's investments are quantitatively and qualitatively significant under subsections (A) and (B). DISH has proved a domestic industry exists in articles protected by the asserted patents.

XVI. CONCLUSIONS OF LAW

1. The Commission has subject matter, personal, and *in rem* jurisdiction in this investigation.
2. The importation requirement has been satisfied.
3. DISH has standing to assert the asserted patents.
4. Claims 1 and 3-5 of the '564 patent have been infringed by the importation, sale, and use of all accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system.
5. Claim 1 of the '156 patent has been infringed by the importation, sale, and use of all accused products.

[REDACTED]

6. Claim 2 of the '156 patent has been infringed by the importation, sale, and use of all Peloton accused products.

7. Claim 4 of the '156 patent has been infringed by the importation, sale, and use of all accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system.

8. Claim 5 of the '156 patent has not been infringed by the importation, sale, and use of all accused products.

9. Claims 16, 17, and 20 of the '554 patent have been infringed by the importation, sale, and use of all accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system.

10. Claims 10 and 11 of the '555 patent have been infringed by the importation, sale, and use of all accused products.

11. Claims 14 and 15 of the '555 patent have been infringed by the importation, sale, and use of all accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system.

12. The technical prong of the domestic industry requirement has been satisfied with respect to the asserted patents.

13. The economic prong of the domestic industry requirement has been satisfied with respect to the asserted patents.

14. The asserted claims have not been shown invalid in view of the prior art.

15. The asserted claims have not been shown to be unenforceable.

16. No asserted claim has been shown invalid as failing to satisfy the requirements of 35 U.S.C. § 112.

17. No asserted claim has been shown to be directed to ineligible subject matter under 35 U.S.C. § 101.

18. A violation of 19 U.S.C. § 1337 has been shown by the importation and sale of articles that infringe claims 1 and 3-5 of the '564 patent.

19. A violation of 19 U.S.C. § 1337 has been shown by the importation and sale of articles that infringe claims 1, 2, and 4 of the '156 patent.

20. A violation of 19 U.S.C. § 1337 has been shown by the importation and sale of articles that infringe claims 16, 17, and 20 of the '554 patent.

21. A violation of 19 U.S.C. § 1337 has been shown by the importation and sale of articles that infringe claims 10, 11, 14, and 15 of the '555 patent.

XVII. RECOMMENDED DETERMINATION ON REMEDY AND BOND

The Commission's Rules provide that the administrative law judge shall issue a recommended determination concerning the appropriate remedy in the event the Commission finds a violation of section 337 and the amount of bond to be posted by respondents during Presidential review of any Commission remedies. *See* 19 C.F.R. § 210.42(a)(1)(ii).

A. Limited Exclusion Order

The Commission has broad discretion in selecting the form, scope, and extent of the remedy in a section 337 proceeding. *Viscofan, S.A. v. U.S. Int'l Trade Comm'n*, 787 F.2d 544, 548 (Fed. Cir. 1986). A limited exclusion order directed to a respondent's infringing products is among the remedies that the Commission may impose. *See* 19 U.S.C. § 1337(d).

With respect to a limited exclusion order, DISH argues that "a permanent [limited exclusion order] should issue excluding from entry into the United States all of Respondents' fitness devices, streaming components thereof, and systems containing same that infringe one or

[REDACTED]

more of the Asserted Claims, not just those adjudicated to infringe in this Investigation.” Compls. Br. at 296 (citing *Certain Audio Players and Controllers, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-1191, Comm’n Op. at 24 (Feb. 1, 2022)).

Respondents dispute that a limited exclusion order would be an appropriate remedy for a violation of section 337, and further contend that, in the event a limited exclusion order is imposed, it “should be limited to include only those products specifically found to infringe, should explicitly exempt any products found not to infringe, and should include a certification provision to minimize the possibility that non-infringing products would be excluded from entry.” Resps. Br. at 295. Respondents further argue that the limited exclusion order “should include a provision delaying enforcement for a period of at least six months to permit implementation of [] non-infringing alternatives.” *Id.*

The Staff recommends including a certification provision because “it is something that ‘[U.S. Customs and Border Protection] typically requests.’” Staff Br. at 280 (quoting *Certain Road Construction Machines and Components Thereof*, Inv. No. 337-TA-1088, Comm’n Op., at 50 (July 15, 2019)); see also *Certain Composite Aerogel Insulation Materials and Methods for Manufacturing the Same*, Inv. No. 337-1003, Comm’n Op., at 62 (Feb. 22, 2018).

If the Commission determines that a violation of section 337 has occurred, I recommend that the Commission issue a limited exclusion order barring entry of products that infringe the asserted patents. I further recommend, in the event the Commission does issue a limited exclusion order in this investigation, the exclusion order should include a provision that allows the respondents to certify, pursuant to procedures to be specified by U.S. Customs and Border Protection, that they are familiar with the terms of the order, that they have made appropriate inquiry, and that, to the best of their knowledge and belief, the products being imported are not

[REDACTED]

excluded from entry under the order. *Certain Chemical Mechanical Planarization Slurries and Components Thereof*, Inv. No. 337-TA-1204, Comm’n Op. at 26 (Jan. 6, 2022).

I also do not recommend that the limited exclusion order be subject to a six-month enforcement delay to implement any redesigns. Respondents propose Peloton’s [REDACTED] and MIRROR’s MPEG-DASH system as potential redesigns, but I have found that neither would suffice as a non-infringing alternative. *See supra* Sec. X, XII.

B. Cease and Desist Order

Section 337 provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order as a remedy for a violation of section 337. *See* 19 U.S.C. § 1337(f)(1). The Commission may issue a cease and desist order when it has personal jurisdiction over the party against whom the order is directed. *Gamut Trading Co. v. U.S. Int’l Trade Comm’n*, 200 F.3d 775, 784 (Fed. Cir. 1999).

Under Commission precedent, “[c]ease and desist orders are generally issued when, with respect to the imported infringing products, respondents maintain commercially significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion order.” *Certain Air Mattress Systems, Components Thereof, and Methods of Using the Same*, Inv. No. 337-TA-971, Comm’n Op. at 49 (May 17, 2017) (citations and footnote omitted). Additionally, at least one Commissioner is of the opinion that the “presence of some infringing domestic inventory, regardless of the commercial significance, provides a basis to issue a cease and desist order.” *Certain L-Tryptophan, L-Tryptophan Products, and Their Methods of Production*, Inv. No. 337-TA-1005, Comm’n Op. at 52 n.49 (Jan. 11, 2018).

DISH requests that the Commission issue a cease and desist order directed to each respondent in the event a violation of section 337 is found. *See* Compls. Br. at 297-98. DISH

[REDACTED]

argues that each respondent holds a commercially significant amount of U.S. inventory of its accused products. *See id.* (citing CX-0007C (Vander Veen DWS) at Q/A 86-88).

The record evidence shows that each respondent maintains a commercially significant inventory of fitness devices, streaming components thereof, and systems containing same in the United States. As of September 27, 2021, Peloton held [REDACTED] of its accused products in inventory, which equates to [REDACTED]. *See* CX-0007C (Vander Veen DWS) at Q/A 88-89. As of November 8, 2021, iFIT held [REDACTED] of its accused products in inventory, which equates to [REDACTED]. *See id.* at Q/A 87. As of August 2021, MIRROR held [REDACTED] of accused products in inventory, which equates to [REDACTED]. *See id.* at Q/A 86.

Respondents argue that any cease and desist order should include exceptions to allow for respondents' continued service and repair of any products already sold to consumers before the effective date of any remedial order and to complete any pending contracts or purchase orders. *See* Resps. Br. at 296. Respondents argue that otherwise customers owning an accused product would be harmed, for example by losing access to warranty repairs. *See id.*

The Staff argues that respondents did not cite to any evidence in their pre-hearing brief substantiating a need for the requested exemption. *See* Staff Br. at 282.

Based on the arguments of the parties and the evidence of record, I recommend that the Commission issue a cease and desist order in the event a violation of section 337 is found. DISH has adduced sufficient evidence showing that each respondent maintains commercially significant amounts of infringing products in the United States. Furthermore, respondents' request for a service/repair exemption should be denied because respondents have failed to provide evidence that the public interest supports this request and because respondents did not produce any evidence

to identify which spare parts are of particular importance or should be permitted entry. *See Certain Unmanned Aerial Vehicles and Components Thereof*, Inv. No. 337-TA-1133, Comm’n Op. (Sept. 8, 2020).

C. Bond During Presidential Review

Pursuant to section 337(j)(3), the Commission must determine the amount of bond to be required of a respondent, during the 60-day Presidential review period following the issuance of permanent relief, in the event that the Commission determines to issue a remedy. The purpose of the bond is to protect the complainant from any injury. 19 U.S.C. § 1337(j)(3); 19 C.F.R. §§ 210.42(a)(1)(ii), 210.50(a)(3).

When reliable price information is available, the Commission has often set bond by eliminating the differential between the domestic product and the imported, infringing product. *Certain Microsphere Adhesives, Processes for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm’n Op. at 24 (1995). In other cases, the Commission has turned to alternative approaches, especially when the level of a reasonable royalty rate could be ascertained. *Certain Integrated Circuit Telecommunication Chips and Products Containing Same, Including Dialing Apparatus*, Inv. No. 337-TA-337, Comm’n Op. at 41 (1995). A 100% bond has been required when no effective alternative existed. *Certain Flash Memory Circuits and Products Containing Same*, Inv. No. 337-TA-382, USITC Pub. No. 3046, Comm’n Op. at 26-27 (July 1997) (a 100% bond imposed when price comparison was not practical because the parties sold products at different levels of commerce, and the proposed royalty rate appeared to be *de minimis* and without adequate support in the record).

The parties agree that a price comparison between the domestic industry products and the accused products is impractical and that there is no basis for setting a bond rate according to a

reasonable royalty rate based on the license agreements produced. *See* CX-0007 (Vander Veen DWS) at Q/A 91; RX-0005C (Mulhern RWS) at Q/A 93.

DISH requests that bond be set at 100% and argues that it would suffer injury because it has licensed the asserted patents in the past. *See* Compls. Br. at 298-300. While DISH concedes that its products do not compete with respondents' accused products, it is argued that DISH has shown that it can generate revenue via licensing. *See id.*

Respondents argue that DISH has failed to meet its burden to show that any bond should issue, and that DISH is not entitled to the 100% bond that it requests. *See* Resps. Br. at 297-98. It is argued that, when the products do not compete with one another, and there is no basis on which to set a bond rate according to a reasonable royalty, a zero percent bond is appropriate. *See id.*

The Staff argues that that DISH has not met its burden to establish the need for a 100% bond because it has not articulated any concrete, alleged injury that it would suffer during the Presidential Review Period. *See* Staff Br. at 283-84. The Staff argues that DISH has not met its burden to show injury, and the absence of such a showing here warrants a recommendation of zero bond. *See id.*

DISH's Pre-Hearing brief did not contain any analysis as to how it allegedly suffered an injury that warrants a bond. *See* Compls. Pre-Hearing Br. at 298-300. DISH thus waived the argument that it will be harmed by the loss of potential licensing revenue. *See* Ground Rule 7.c. Moreover, DISH's argument regarding potential licensing revenue is not tied to any injury caused by sales of the accused products during the Presidential Review Period. Accordingly, no bond should issue.

XVIII. INITIAL DETERMINATION ON VIOLATION

For the reasons set forth above, it is my initial determination that a violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States and the sale within the United States after importation of certain fitness devices, streaming components thereof, and systems containing same, with respect to U.S. Patent No. 9,407,564; U.S. Patent No. 10,469,554; U.S. Patent No. 10,469,555; and U.S. Patent No. 10,757,156.

I hereby certify to the Commission this Initial Determination and the Recommended Determination.

The Secretary shall serve the confidential version of this Initial Determination upon counsel who are signatories to the Protective Order (Order No. 1) issued in this investigation. A public version will be served at a later date upon all parties of record.

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review pursuant to 19 C.F.R. § 210.43(a) or the Commission, pursuant to 19 C.F.R. § 210.44, orders on its own motion a review of the Initial Determination or certain issues therein.

XIX. ORDER

To expedite service of the public version of this document, the parties shall file a joint proposed public version, on the date and in the manner required by Order No. 20.

SO ORDERED.

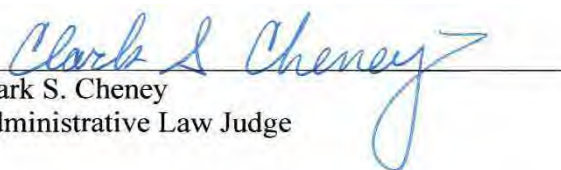

Clark S. Cheney
Administrative Law Judge

EXHIBIT U

PUBLIC VERSION

UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.

In the Matter of

**CERTAIN FITNESS DEVICES,
STREAMING COMPONENTS
THEREOF, AND SYSTEMS
CONTAINING SAME**

Investigation No. 337-TA-1265

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PUBLIC VERSION**I. INTRODUCTION**

On November 18, 2022, the Commission determined to review in part the final initial determination (“Final ID”) issued by the presiding chief administrative law judge (“CALJ”) on September 9, 2022. 87 Fed. Reg. 72510, 72510–13 (Nov. 25, 2022). The Final ID had found a violation of section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, with respect to the alleged importation into the United States, the sale for importation, or the sale within the United States after importation of certain fitness devices, streaming components thereof, and systems containing same alleged to infringe certain claims of U.S. Patent Nos. 9,407,564 (“the ’564 patent”); 10,469,554 (“the ’554 patent”); 10,469,555 (“the ’555 patent”); and 10,757,156 (“the ’156 patent”) (collectively, the “Asserted Patents”).

On review, the Commission has determined to affirm the Final ID’s finding that Complainants’ domestic industry products practice one or more claims of the ’156, ’554, and ’555 patents based on modified reasoning, but to reverse the Final ID’s finding that Complainants’ domestic industry products practice one or more claims of the ’564 patent, for the reasons discussed below. The Commission also affirms with modifications the Final ID’s findings that the asserted claims of the ’554 and ’555 patents can claim priority to U.S. App. No. 60/566,831 (“the ’831 Provisional Application”) and are not invalid over the prior public use of the Move Media Player. The Commission additionally finds that Respondents did not show that the asserted claims of the ’555 patent are invalid for misjoinder of inventorship. Accordingly, the Commission finds a violation of section 337 as to the asserted claims of the ’156, ’554, and ’555 patents, but not as to the asserted claims of the ’564 patent.

As a remedy, the Commission has determined to issue a limited exclusion order (“LEO”) and cease and desist orders (“CDOs”) to the remaining Respondents. The Commission has found that the public interest factors do not preclude the issuance of this

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remedy. The Commission has further determined to set a bond in the amount of zero percent (0%) of the entered value of the covered products (*i.e.*, no bond) during the period of Presidential Review.

The Commission has additionally determined to grant a joint motion to terminate the investigation as to certain respondents.

This opinion sets forth the Commission’s reasoning in support of these determinations. The Commission affirms and adopts the Final ID’s findings, conclusions, and supporting analysis that are not inconsistent with the Commission’s opinion.

II. BACKGROUND**A. Overview of the Procedural History**

On May 19, 2021, the Commission instituted this investigation based on a complaint filed on behalf of DISH DBS Corporation of Englewood, Colorado; DISH Technologies, L.L.C. of Englewood, Colorado; and Sling TV L.L.C. of Englewood, Colorado (collectively, “DISH”).¹ 86 Fed. Reg. 27106, 27106–07 (May 19, 2021). The Complaint alleged a violation of section 337 based upon the importation into the United States, the sale for importation, and the sale within the United States after importation of certain fitness devices, streaming components thereof, and systems containing the same by reason of infringement of certain claims of the ’564, ’554, ’555, and ’156 patents and U.S. Patent No. 10,951,680 (“the ’680 patent”). *Id.* The notice of investigation named as respondents ICON Health & Fitness, Inc. of

¹ Complaint of DISH DBS Corporation et al. Under Section 337 of the Tariff Act of 1930, as Amended, EDIS Doc. ID 739751 (Apr. 13, 2021) (“Complaint” or “Compl.”).

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Logan, Utah (“ICON” or “iFIT Inc.”)²; FreeMotion Fitness, Inc. of Logan, Utah (“FreeMotion”); NordicTrack Inc. of Logan, Utah (“NordicTrack,” and together with ICON and FreeMotion, “iFit”); lululemon athletica inc. of Vancouver, Canada (“lululemon”); Curiouser Products Inc. d/b/a MIRROR of New York, New York (“Curiouser,” and together with lululemon, “MIRROR”); and Peloton Interactive, Inc. of New York, New York (“Peloton,” and together with the other respondents, “Respondents”). *Id.*; Order No. 14 (Nov. 4, 2021), *unreviewed by* Comm’n Notice (Dec. 6, 2021), 86 Fed. Reg. at 70532. The Commission’s Office of Unfair Import Investigations (“OUII”) also was named as a party in this investigation. 86 Fed. Reg. at 27106–07.

Prior to the issuance of the Final ID, several claims of the Asserted Patents and all asserted claims of the ’680 patent were terminated from the investigation. *See* Order No. 15 (Nov. 19, 2021), *unreviewed by* Comm’n Notice (Dec. 21, 2021); Order No. 21 (Mar. 3, 2022), *unreviewed by* Comm’n Notice (Mar. 23, 2022). A prehearing conference was held on March 9, 2022, and the evidentiary hearing commenced immediately thereafter. DISH, iFIT, Inc., FreeMotion, NordicTrack, lululemon, Curiouser, and Peloton participated in the hearing. The hearing concluded on March 14, 2022. *See* Order No. 20 (Mar. 1, 2022).

On March 29, 2022, DISH filed its opening post-hearing brief,³ which asserted, against all respondents, claims 1 and 3–5 of the ’564 patent, claims 16, 17, and 20 of the ’554 patent, claims 10, 11, 14, and 15 of the ’555 patent, and claims 1, 4, and 5 of the ’156 patent. DISH

² Prior to the issuance of the Final ID, the notice of investigation was amended such that the name of respondent “ICON Health & Fitness, Inc.” was replaced with the name “iFIT Inc.” *See* Order No. 14 (Nov. 4, 2021), *unreviewed by* Comm’n Notice (Dec. 6, 2021), 86 Fed. Reg. 70532 (Dec. 10, 2021).

³ Complainants’ Post-Hearing Brief, EDIS Doc. ID 766879 (Mar. 29, 2022) (“CPHBr.”).

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also asserted claim 2 of the '156 patent against Peloton. That same day, Respondents and OUII also filed their opening post-hearing briefs.⁴ On April 7, 2022, or April 13, 2022, the parties filed their reply post-hearing briefs.⁵

On June 23, 2022, the investigation was reassigned to the CALJ. *See* Notice to the Parties, EDIS Doc. ID 773712 (June 23, 2022).

On September 9, 2022, the CALJ issued the Final ID, which found that Respondents violated section 337. More particularly, the Final ID found, *inter alia*:

1. The importation requirement of section 337 has been satisfied.
2. Claims 1 and 3–5 of the '564 patent have been infringed by the importation, sale, and use of all accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system.
3. Claim 1 of the '156 patent has been infringed by the importation, sale, and use of all accused products.
4. Claim 2 of the '156 patent has been infringed by the importation, sale, and use of all Peloton accused products.
5. Claim 4 of the '156 patent has been infringed by the importation, sale, and use of all accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system.
6. Claim 5 of the '156 patent has not been infringed by the importation, sale, and use of all accused products.
7. Claims 16, 17, and 20 of the '554 patent have been infringed by the importation, sale, and use of all accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system.

⁴ Respondents' Post-Hearing Brief, EDIS Doc. ID 766872 (Mar. 29, 2022) ("RPHBr."); The Commission Investigative Staff's Post-Hearing Brief, EDIS Doc. ID 767210 (Mar. 29, 2022) ("OPHBr.>").

⁵ Complainants' Post-Hearing Reply Brief, EDIS Doc. ID 767641 (Apr. 7, 2022) ("CPHBr. (Reply)"); Respondents' Reply Post-Hearing Brief, EDIS Doc. ID 767625 (Apr. 7, 2022) ("RPHBr. (Reply)"); Commission Investigative Staff's Post-Hearing Reply Brief, EDIS Doc. ID 768166 (Apr. 13, 2022) ("OPHBr. (Reply)").

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8. Claims 10 and 11 of the '555 patent have been infringed by the importation, sale, and use of all accused products.
9. Claims 14 and 15 of the '555 patent have been infringed by the importation, sale, and use of all accused products, with the exception of Peloton's [REDACTED] and MIRROR's MPEG-DASH system.
10. The domestic industry requirement has been satisfied with respect to the Asserted Patents.
11. The asserted claims have not been shown invalid in view of the prior art.
12. The asserted claims have not been shown to be unenforceable.
13. No asserted claim has been shown invalid as failing to satisfy the requirements of 35 U.S.C. § 112.
14. No asserted claim has been shown to be directed to ineligible subject matter under 35 U.S.C. § 101.
15. A violation of section 337 has been shown by the importation and sale of articles that infringe claims 1 and 3–5 of the '564 patent, claims 1, 2, and 4 of the '156 patent, claims 16, 17, and 20 of the '554 patent, and claims 10, 11, 14, and 15 of the '555 patent.

Final ID at 254–56.

On September 23, 2022, Respondents and OUII filed petitions for review of the Final ID.⁶ On October 3, 2022, DISH and OUII filed responses to the petitions.⁷ On October 11,

⁶ Respondents' Petition for Review of the Initial Determination, EDIS Doc. ID 780944 (Sept. 23, 2022) ("RPet."); The Office of Unfair Import Investigations' Petition for Review-in-Part of the Final Initial Determination, EDIS Doc. ID 780956 (Sept. 23, 2022) ("OPet.").

⁷ Complainants' Combined Response to Respondents' and the Office of Unfair Import Investigations' Petitions for Review of the Initial Determination, EDIS Doc. ID 781544 (Oct. 3, 2022) ("CResp."); The Office of Unfair Import Investigations' Response to Respondents' Petition for Review in Part of the Final Initial Determination, EDIS Doc. ID 781497 (Oct. 3, 2022) ("OResp.").

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2022, the private parties filed their public interest statements.⁸ The Commission did not receive any comments on the public interest from non-parties or from OUII.

On November 18, 2022, after considering the parties' petitions and the responses thereto, the Commission determined to review the Final ID in part. 87 Fed. Reg. at 72510–13.

In particular, the Commission reviewed the following:

- (1) whether DISH satisfied the technical prong of the domestic industry requirement as to all Asserted Patents;
- (2) whether claims 16, 17, and 20 of the '554 patent and claims 14 and 15 of the '555 patent are entitled to claim priority to U.S. App. No. 60/566,831;
- (3) whether claims 16, 17, and 20 of the '554 patent and claims 14 and 15 of the '555 patent are invalid as anticipated over the prior public use of the Move Media Player;
- (4) whether the asserted claims of the '555 patent are invalid for misjoinder of Mr. Brueck; and
- (5) whether the preamble of claim 10 of the '555 patent is limiting.

Id. The Commission requested briefing on certain issues under review and on remedy, the public interest, and bonding. *See id.*

⁸ Complainants' Public Interest Statement, EDIS Doc. ID 782024 (Oct. 11, 2022) ("DStmt."); Respondent Peloton Interactive, Inc.'s Public Interest Statement, EDIS Doc. ID 782020 (Oct. 12, 2022) ("PStmt."); Public Interest Statement by Respondents iFIT Inc., f/k/a ICON Health & Fitness, Inc., FreeMotion Fitness, Inc., and NordicTrack, Inc., EDIS Doc. ID 782048 (Oct. 11, 2022) ("iStmt."); Respondents lululemon athletica inc. and Curiouser Products Inc. (d/b/a MIRROR) Rule 210.50(a)(4) Submission of Information Relating to the Public Interest, EDIS Doc. ID 782029 (Oct. 11, 2022) ("MStmt.").

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On December 2, 2022, the parties filed their written submissions on the issues under review and on remedy, public interest, and bonding,⁹ and on December 9, 2022, the parties filed their reply submissions.¹⁰

On February 13, 2023, MIRROR and DISH filed a joint, unopposed motion to partially terminate the investigation as to MIRROR based on a settlement agreement between DISH and MIRROR.¹¹ The MIRROR Motion asserts that “[t]here is a settlement agreement between DISH and MIRROR concerning the subject matter of this Investigation.” MIRROR Mtn. at 1. The motion further declares that there are “no other agreements, written or oral, express or implied between the parties concerning the subject matter of the Investigation.” *Id.* The motion additionally asserts that good cause exists to terminate the investigation as to MIRROR in view of the settlement agreement and that termination of the investigation would not adversely affect the public interest. *See id.* at 1–2 (citing, in part, *Certain Active-Matrix OLED Display Devices*

⁹ Complainants’ Opening Submission on the Issues under Review and on Remedy, the Public Interest, and Bonding, EDIS Doc ID 785576 (Dec. 2, 2022) (“CBr.”); Respondents’ Response to the Commission’s November 18, 2022 Request for Written Submissions on the Issues under Review and on Remedy, the Public Interest, and Bonding, EDIS Doc ID 785569 (Dec. 2, 2022) (“RBr.”); Response of the Office of Unfair Import Investigations to the Commission’s Request for Written Submissions on the Issues under Review and on Remedy, Bonding, and the Public Interest, EDIS Doc ID 785555 (Dec. 2, 2022) (“OUIIBr.”).

¹⁰ Complainants’ Reply Submission to the Commission’s Questions on the Issues under Review and on Remedy, the Public Interest, and Bonding, EDIS Doc ID 786089 (Dec. 12, 2022) (“CBr. (Reply)”); Respondents’ Reply to the Commission’s November 18, 2022 Request for Written Submissions on the Issues under Review and on Remedy, the Public Interest, and Bonding, EDIS Doc ID 786060 (Dec. 12, 2022) (“RBr. (Reply)”); Reply of the Office of Unfair Import Investigations to the Responses to the Commission’s Request for Written Submissions on the Issues under Review and on Remedy, Bonding, and the Public Interest, EDIS Doc ID 786054 (Dec. 12, 2022) (“OUIIBr. (Reply)”).

¹¹ Joint Motion of DISH and Mirror to Partially Terminate the Investigation as to MIRROR Based on Settlement Agreement, EDIS Doc. ID 790133 (Feb. 13, 2023) (“MIRROR Motion” or “MIRROR Mtn.”).

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& Components Thereof, Inv. No. 337-TA-1243, Comm’n Notice (Oct. 28, 2021) (EDIS Doc ID 755387); *Certain Digital Cameras, Software, & Components Thereof*, Inv. No. 337-TA-1059, Comm’n Notice at 3 (Mar. 8, 2019) (EDIS Doc ID 669518) (“[T]he public interest favors settlement to avoid needless litigation and to conserve public and private resources.”)) (other citations omitted).

On February 23, 2023, OUII filed a response supporting the motion.¹²

The Commission has determined to grant the MIRROR Motion. The motion complies with the Commission’s Rules, is not adverse to the public interest, and there are no extraordinary circumstances that would warrant denying the motion. *See* 19 C.F.R. § 210.21(b).^{13, 14} Accordingly, respondents lululemon athletica inc. and Curiouser Products Inc. d/b/a MIRROR are terminated from the investigation based on settlement.

B. Overview of the Technology

The technology at issue generally relates to streaming video and audio content over the Internet. The parties stipulated to the following general description of the technology at issue (delivery of video over networks such as the Internet using adaptive bitrate streaming):

Streaming refers to technology that delivers audio/video content from a server to a client at a bitrate that allows the user to view the content contemporaneous with its receipt. The higher the bitrate of the video, the

¹² Response of the Office of Unfair Import Investigations to the Joint Motion of DISH and Mirror to Partially Terminate the Investigation as to MIRROR Based on Settlement Agreement, EDIS Doc. ID 790996 (Feb. 23, 2023).

¹³ Commission Rule 210.21(b)(2), 19 C.F.R. § 210.21(b)(2), provides that a motion for termination by settlement together with the public and confidential versions of the settlement agreement must be certified by the ALJ to the Commission with an initial determination if the motion is granted. The Commission hereby waives this requirement of Commission Rule 210.21(b).

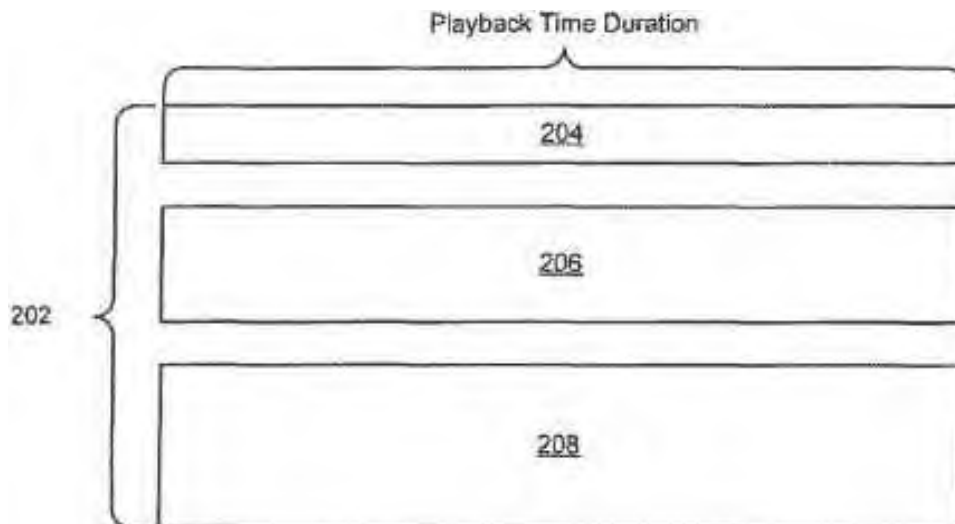
¹⁴ Accordingly, the respondents remaining in this investigation are iFIT, Inc., FreeMotion, NordicTrack, and Peloton (the “Remaining Respondents”).

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more data (in bits) it takes to represent and stream that video. The delivery of the content may be limited by the speed of the end-user's network connection. The network speed can change during the course of content delivery resulting in buffering and stalling. Adaptive bitrate streaming systems may shift the bitrate of the audio/video content based on the network speed in an attempt to avoid stalling.

Joint Tech. Stip. at 2 (Oct. 15, 2021), EDIS Doc. ID 754337.

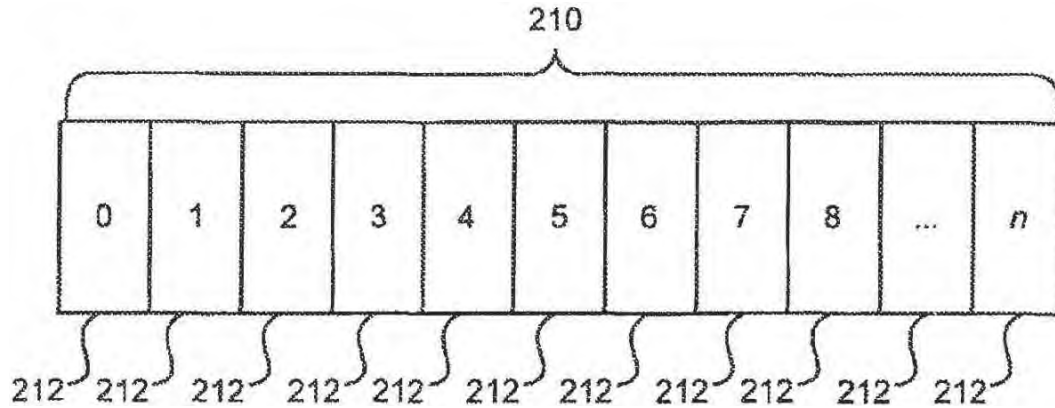
The Asserted Patents relate to adaptive bitrate streaming. *See, e.g.*, JX-0001 ('564 patent) at 1:31–41. The adaptive bitrate streaming technology includes encoding the content file into at least three different quality streams, as shown in Figure 2b of the '564 patent, reproduced below:



Id. at Fig. 2b. As shown in Figure 2b, the plurality of streams 202 have varying degrees of quality and bandwidth, and include a low-quality stream 204, a medium-quality stream 206, and a high-quality stream 208, as represented by the relative thicknesses of the demonstrative rectangles. *See id.* at 6:46–50. Each of the streams 204, 206, and 208 is a copy of the content file encoded and compressed to varying bit rates. *See id.* at 6:51–52.

Each of the streams 204, 206, and 208 (referred to generally as stream 210 in the figure below) is then further subdivided into discrete portions called “streamlets” 212, as shown in Figure 2c of the '564 patent, reproduced below:

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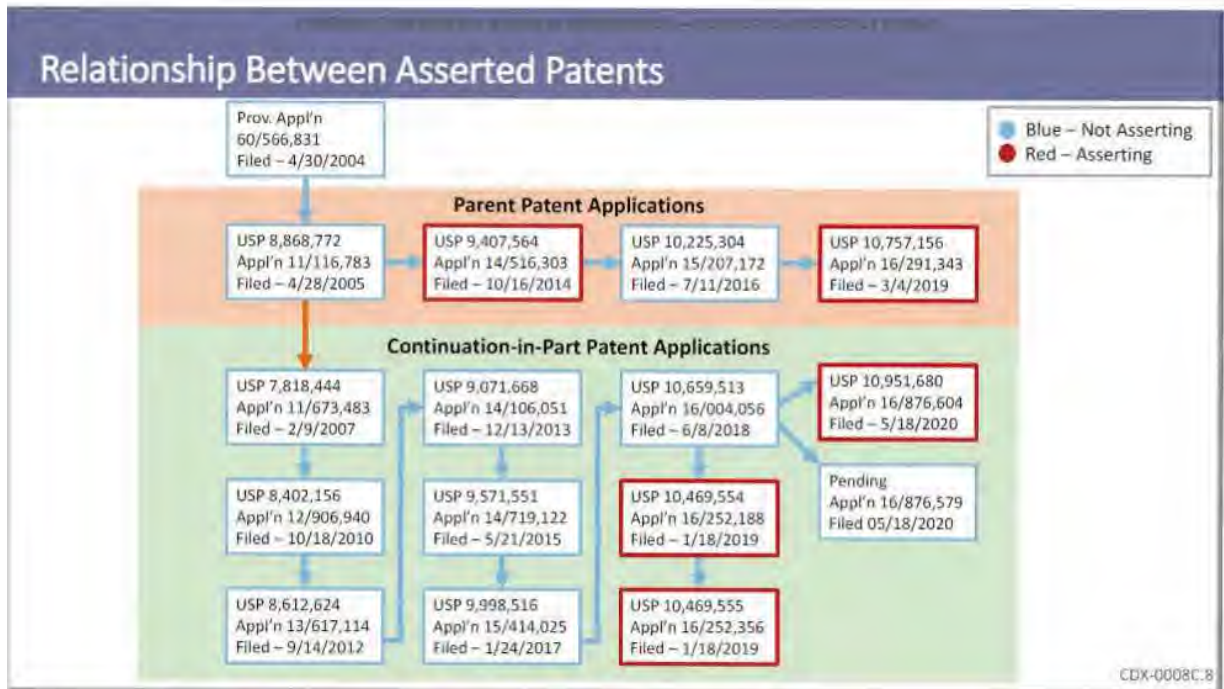


Id. at Fig. 2c; *see id.* at 6:58–60. Each streamlet 212 comprises a portion of the content contained in stream 210. *See id.* at 6:61–62. Streamlets are aligned by starting time and duration across the different quality streams such that a particular streamlet in, *e.g.*, a low-quality stream and a medium-quality stream, corresponds to the same portion of the content file. *See* JX-0001 ('564 patent) at 6:62–7:7. This allows end user equipment to switch between different quality streamlets in response to changing network conditions.

C. The Asserted Patents

DISH now asserts four patents in this investigation: the '564, '156, '554, and '555 patents. The Asserted Patents all claim priority to the '831 Provisional Application, which was filed on April 30, 2004. *See* JX-0001 ('564 patent) at cover page; JX-0004 ('156 patent) at cover page; JX-0002 ('554 patent) at cover page; JX-0003 ('555 patent) at cover page; JX-0029 ('831 Provisional Application) at 2. The following demonstrative illustrates the family of patents and applications that includes the Asserted Patents:

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CDX-0008C at 8.¹⁵ The '564 and '156 patents issued from continuation applications claiming priority to the parent application for all Asserted Patents, U.S. Application No. 11/116,783 ("the '783 Application"). The specifications of the '564 and '156 patents are similar. The '554 and '555 patents issued from a continuation-in-part ("CIP") application, U.S. Application No. 11/673,483 ("the '483 CIP Application"). The specifications of the '554 and '555 patents are likewise similar and may be referred to herein as the "CIP Specification."

1. U.S. Patent No. 9,407,564

The '564 patent, titled "Apparatus, System, and Method for Adaptive-Rate Shifting of Streaming Content," issued on August 2, 2016, and names Robert Drew Major and Mark B. Hurst as inventors. JX-0001 ('564 patent) at cover page. The '564 patent issued from application no. 14/516,303, filed on October 16, 2014. *Id.* DISH asserts independent claim 1

¹⁵ As noted above, DISH is no longer asserting the '680 patent.

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and dependent claims 3–5. *See* CPHBr.¹⁶ at 2. DISH relies on claims 1, 3, and 5 of the ’564 patent to satisfy the technical prong of the domestic industry requirement. *See id.*

2. U.S. Patent No. 10,757,156

The ’156 patent, titled “Apparatus, System, and Method for Adaptive-Rate Shifting of Streaming Content,” issued on August 25, 2020, and also names Robert Drew Major and Mark B. Hurst as inventors. JX-0004 (’156 patent) at cover page. The ’156 patent issued from application no. 16/291,343, filed on March 4, 2019. *Id.* DISH asserts independent claim 1 and dependent claims 2 (Peloton only), 4, and 5. *See* CPHBr. at 2. DISH relies on claims 1 and 4 of the ’156 patent to satisfy the technical prong of the domestic industry requirement. *See id.* at 2, 156.

3. U.S. Patent No. 10,469,554

The ’554 patent, titled “Apparatus, System, and Method for Multi-Bitrate Content Streaming,” issued on November 5, 2019, and, like the ’156 and ’564 patents, names R. Drew Major and Mark B. Hurst as inventors, but also adds inventor David F. Brueck. JX-0002 (’554 patent) at cover page. The ’554 patent issued from application no. 16/252,188, filed on January 18, 2019. *Id.* DISH asserts independent claim 16 and dependent claims 17 and 20. *See* CPHBr. at 2. DISH relies on claims 16 and 17 of the ’554 patent to satisfy the technical prong of the domestic industry requirement. *See id.* at 139.

4. U.S. Patent No. 10,469,555

The ’555 patent, titled “Apparatus, System, and Method for Multi-Bitrate Content Streaming,” issued on November 5, 2019, and, like the ’554 patent, names Mark B. Hurst, R.

¹⁶ Complainants’ Post-Hearing Brief, EDIS Doc. ID 766879 (Mar. 29, 2022) (“CPHBr.”).

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Drew Major, and David F. Brueck as inventors.¹⁷ JX-0003 ('555 patent) at cover page. The '555 patent issued from application no. 16/252,356, filed on January 18, 2019. *Id.* DISH asserts independent claim 10 and dependent claims 11, 14, and 15. *See* CPHBr. at 2. DISH relies on claims 10, 11, and 14 of the '555 patent to satisfy the technical prong of the domestic industry requirement. *See* CPHBr. at 151.

D. The Accused Products

The accused products are “Internet-streaming enabled video displays and components thereof that are capable of using adaptive bit-rate streaming to stream content for fitness devices, and fitness devices containing such internet-streaming video displays and components.” Compl. at ¶ 4.1. DISH accuses the following products for each of the Remaining Respondents:

Respondent	Representative Product	Accused Product(s)
Peloton	Peloton Bike running Peloton application software available on April 13, 2021, as it operates when receiving on demand and live content in the format created, used, or provided by Peloton as of April 13, 2021	Peloton Bike; Peloton Bike+; Peloton Tread; Peloton Tread+; Touchscreen (Topaz) US/CA; Touchscreen (Quartz) Gen 1; Touchscreen Qbert – U.S. & CAN; and Touchscreen (Sapphire) products
iFit	NordicTrack Commercial S15i running iFit application software available on April 13, 2021	ProForm Vue, NordicTrack Vault (complete), NordicTrack Vault (standalone), ProForm Studio Bike Pro, ProForm Studio Bike Pro 22, FreeMotion r22.9, FreeMotion u22.9, FreeMotion Coachbike, NordicTrack Commercial S15i, NordicTrack Commercial S22i, NordicTrack Commercial VR25, NordicTrack Commercial R35, NordicTrack Commercial VU 19, NordicTrack Commercial

¹⁷ Whether Mr. Brueck is properly named as an inventor on the '555 patent is a disputed issue discussed in this Commission opinion.

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		VU 29, ProForm R10, NordicTrack RW600, NordicTrack RW700, NordicTrack RW900, ProForm Carbon T7, ProForm Carbon T10, ProForm Pro 2000, ProForm Pro 9000, ProForm Carbon E7, ProForm Pro E14, ProForm Carbon HIIT H7, ProForm Carbon HIIT H14, FreeMotion i22.9, FreeMotion t22.9, FreeMotion e22.9 Elliptical, NordicTrack X22i, NordicTrack X32i, NordicTrack Commercial 1750, NordicTrack Commercial 2450, NordicTrack Commercial 2950, NordicTrack EXP 7i, NordicTrack EXP 10i, NordicTrack T 6.5 Si, NordicTrack FS10i, NordicTrack FS14i, NordicTrack Commercial 9.9, NordicTrack Commercial 14.9, and NordicTrack SpaceSaver SE9i products running iFit application software available on April 13, 2021
iFit	NordicTrack Fusion CST Pro, if running iFit application software that was available on April 13, 2021	NordicTrack Fusion CST and NordicTrack Fusion CST Pro products running iFit application software available on April 13, 2021

See Joint Stipulation of DISH and Peloton as to Representative Products, EDIS Doc. ID 755504, at 1–2 (Oct. 29, 2021); Joint Stipulation of DISH and iFIT as to Representative Products, EDIS Doc. ID 755539, at 1–2 (Oct. 29, 2021); OPHBr. at 16–21.

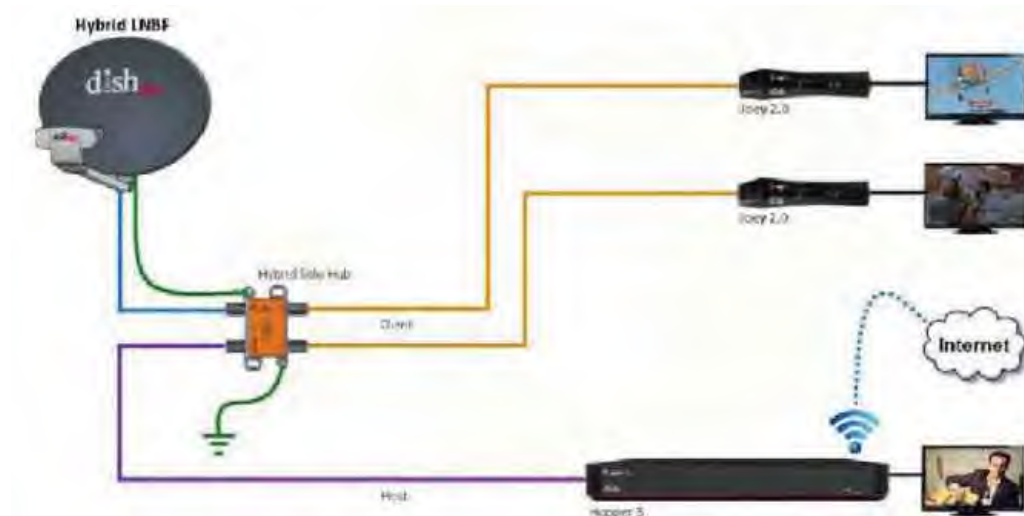
E. The Domestic Industry Products

The domestic industry products include DISH’s set-top boxes, including the Hopper, Hopper with Sling, Hopper 3, Hopper Duo, and Wally products (collectively, the “DISH Set-Top Boxes”). *See* CPHBr. at 117. DISH further contends that the Sling TV Applications (“Sling Apps”) for the Amazon Fire (the “Sling Fire App”), the Sling App for iOS, and the Sling App for Roku practice the asserted domestic industry claims. *See id.* at 120–21.

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The DISH Set-Top Boxes provide both satellite-TV and Internet-streaming functionality to the user's television or other display, as shown in the figure below. *See* CX-0002C

(Kroonenberg¹⁸ DWS) at Q/A 53–54.



CX-0062 (Hopper Installation Guide) at 1. It is undisputed that DISH's Set-Top Boxes do not themselves have screens or displays. *E.g.*, RBr. at 10; OPet. at 2. The Final ID found that the Hopper 3 set-top box is representative of the DISH Set-Top Boxes produced after December 2017. *See* Final ID at 78.

The Sling Apps “deliver[] television programming and other content under the Sling TV brand, but solely via the Internet.” CX-0002C (Kroonenberg DWS) at Q/A 19. DISH provides the Sling Apps for a variety of different platforms, including the Amazon Fire, Apple TV, Roku, Samsung Smart TV, LG Smart TV, and Xbox game console. *Id.* DISH proceeded only with evidence regarding the Sling Fire App, but the Final ID found that DISH did not establish that any one Sling App is representative of any other. *See* Final ID at 79.

¹⁸ Stuart Kroonenberg is a DISH employee.

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III. COMMISSION REVIEW OF THE FINAL INITIAL DETERMINATION

When the Commission reviews an initial determination, in whole or in part, it reviews the determination *de novo*. *Certain Soft-Edged Trampolines & Components Thereof*, Inv. No. 337-TA-908, Comm’n Op. at 4 (May 1, 2015). Upon review, the “Commission has ‘all the powers which it would have in making the initial determination,’ except where the issues are limited on notice or by rule.” *Certain Flash Memory Circuits & Prods. Containing Same*, Inv. No. 337-TA-382, USITC Pub. No. 3046, Comm’n Op. at 9–10 (July 1997) (quoting *Certain Acid-Washed Denim Garments & Accessories*, Inv. No. 337-TA-324, Comm’n Op. at 5 (Nov. 1992)). With respect to the issues under review, “the Commission may affirm, reverse, modify, set aside or remand for further proceedings, in whole or in part, the initial determination of the administrative law judge.” 19 C.F.R. § 210.45(c). The Commission also “may take no position on specific issues or portions of the initial determination,” and “may make any finding or conclusions that in its judgment are proper based on the record in the proceeding.” *Id.*; *see also* *Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984).

IV. THE ISSUES UNDER REVIEW**A. Whether DISH Satisfied the Technical Prong of the Domestic Industry Requirement****1. The Applicable Law**

For a patent-based complaint, a violation of section 337 can be found “only if an industry in the United States, relating to the articles protected by the patent . . . concerned, exists or is in the process of being established.” 19 U.S.C. § 1337(a)(2). The complainant bears the burden of establishing that the domestic industry requirement is satisfied. *See Certain Set-Top Boxes & Components Thereof*, Inv. No. 337-TA-454, ID at 294 (June 21, 2002) (unreviewed in relevant part).

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This domestic industry requirement of section 337 is often described as having an economic prong and a technical prong. *InterDigital Commc'ns, LLC v. Int'l Trade Comm'n*, 707 F.3d 1295, 1298 (Fed. Cir. 2013); *Certain Stringed Musical Instruments & Components Thereof*, Inv. No. 337-TA-586, USITC Pub. 4120, Comm'n Op. at 12–14 (Dec. 2009). The technical prong of the domestic industry requirement is satisfied when the complainant in a patent-based section 337 investigation establishes that it is practicing or exploiting the patents at issue. See 19 U.S.C. §§ 1337(a)(2), (3); *Certain Microsphere Adhesives, Process for Making Same & Prods. Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm'n Op. at 8 (Jan. 16, 1996). “The test for satisfying the ‘technical prong’ of the industry requirement is essentially [the] same as that for infringement, *i.e.*, a comparison of domestic products to the asserted claims.” *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). To prevail, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more claims of the patent. It is sufficient to show that the products practice any claim of that patent, not necessarily a claim of that patent asserted for infringement purposes. See *Certain Male Prophylactic Devices*, Inv. No. 337-TA-546, Comm'n Op. at 38 (Aug. 1, 2007).

A determination of infringement, and thus, domestic industry, requires a two-step analysis. *Ethicon Endo-Surgery, Inc. v. U.S. Surgical Corp.*, 149 F.3d 1309, 1315 (Fed. Cir. 1998). “First, the claim must be properly construed to determine its scope and meaning. Second, the claim as properly construed must be compared to the accused device or process.” *Id.* Under the first step, “when the parties present a fundamental dispute regarding the scope of a claim term, it is the court’s duty to resolve it.” *O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008).

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“[A] claim construction analysis must begin and remain centered on the claim language itself, for that is the language the patentee has chosen to particularly point[] out and distinctly claim[] the subject matter which the patentee regards as his invention.” *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004) (internal quotation marks and citation omitted). Claims should be given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006).

The specification usually is the best guide to the meaning of the term. *Phillips*, 415 F.3d at 1315. As a general rule, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). The specification is, however, always highly relevant to the claim construction analysis, and is usually dispositive. *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Moreover, “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.” *Id.* at 1316.

2. Waiver

In its pre-hearing brief to the ALJ, DISH argued that its domestic industry products, the DISH Set-Top Boxes and the Sling Apps¹⁹ alone, practice the claims of the Asserted Patents

¹⁹ While, as noted above, the Final ID only adjudicated the Sling Fire App (*see* Final ID at 79), DISH’s briefing before the ALJ and, after reassignment, the CALJ addressed the Sling Apps generally.

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and thus satisfy the technical prong of the domestic industry requirement alone.²⁰ *See, e.g.*, CPreHBr. at 127–28. This theory is referred to herein as the “direct practice theory.” However, in its post-hearing briefing, DISH also presented a second theory, that the combination of either the DISH Set-Top Box or a Sling App with a display provided by a DISH customer practices the claims of the Asserted Patents. *See, e.g.*, CPHBr. at 11–25, 160–67. This latter theory is referred to herein as the “indirect practice theory.” The Final ID found the technical prong of the domestic industry requirement to be satisfied based on the indirect practice theory. *See* Final ID at 108–12. The Final ID did not make a finding as to the direct practice theory, and as a result, did not resolve an underlying claim construction dispute relevant to that theory. *See id.* at 109 n.18.

Respondents and OUII both petitioned the Commission to review the Final ID’s technical prong findings, arguing that the Final ID relied on a theory outside the scope of the investigation. *See, e.g.*, RPet. at 5–24; OPet. at 7–17. Respondents argue that, despite DISH being on notice of Respondents’ argument that DISH’s domestic industry products do not practice the claims because they lack a display, DISH’s pre-hearing brief relied on the domestic industry products alone. RBr. at 9–10.

The Commission finds that DISH waived its indirect practice theory under the ALJ’s Ground Rules. Ground Rule 7c declared that the parties’ pre-hearing briefs and statements shall include:

[A] statement of the issues to be considered at the hearing that sets forth *with particularity* a party’s contentions on each of the proposed issues, including citations to supporting facts and legal authorities, *e.g.*, proposed exhibits. Incorporation by reference is not allowed. *Any contentions not*

²⁰ Pre-Hearing Brief of Complainant DISH, EDIS Doc. ID 763108 (Feb. 11, 2022) (“CPreHBr.”).

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set forth in detail as required therein shall be deemed abandoned or withdrawn, except for contentions of which a party is not aware and could not be aware in the exercise of reasonable diligence at the time of filing the prehearing statement.

Order No. 12 (Amended Ground Rules) at 11–12 (emphases added).

The Commission finds that DISH was on notice before it filed its pre-hearing brief that Respondents were alleging that DISH failed to satisfy the domestic industry requirement because its domestic industry products lack a display. Specifically, on September 22, 2021, Respondents provided their initial non-burden contentions, arguing that DISH’s domestic industry products do not practice the relevant claims because they lack displays. *See* Respondents’ Opposition to DISH’s Motion to Strike, EDIS Doc. ID 764439, at 4 (Mar. 3, 2022) (citing Exh. 2, Appx. A, pp. 7 and 12, and Exh. 3, at Appx. A, pp. 14, 28, and 29) (“ROpp’n to Mtn. to Strike”). That response declared:

Claim 1 requires a “presenting the video by playing back the requested media files.” DISH has alleged that its Sling TV Application permits “an end-user station” to perform certain functions. However, the Sling TV Application and DISH Anywhere Applications are software that can be installed on various devices, but does not have a display screen to show video. Similarly, . . . DISH’s Set Top Boxes do not contain a display screen and cannot display content.

Id. at Exh. 2, Appx. A, p. 7.

On February 11, 2022, and February 18, 2022, the parties filed their pre-hearing briefs.²¹ Despite being on notice of Respondents’ argument, DISH’s pre-hearing brief did not rely on customers’ displays or otherwise disclose its indirect practice theory. *See, e.g.*, CPreHBr. at

²¹ Respondents’ Pre-Hearing Brief, EDIS Doc. ID 763104 (Feb. 11, 2022) (“RPreHBr.”); Commission Investigative Staff’s Pre-Hearing Brief, EDIS Doc. ID 763575 (Feb. 18, 2022) (“OPreHBr.”).

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127–28. Regarding the disputed limitation in claim 1 of the ’564 patent, DISH’s pre-hearing brief simply stated:

When the Hopper 3 STB selects the Variant Stream corresponding to the highest resolution “profile_3_05_5_nagra”, the media player subsequently requests and plays back sequential Media Segment files from this Variant Stream prior to application of bandwidth throttling. The GStreamer media player within DISH STBs, such as the Hopper 3 STB, operates to “present[] the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.” This was confirmed by the source code.

When the Sling Fire App selects the Representation corresponding to the highest resolution “vid06”, the media player subsequently requests and plays back in order of ascending playback time sequential Media Segment files from this Representation prior to application of bandwidth throttling and then similarly subsequent to application of bandwidth throttling. Source code shows that ExoPlayer in the Sling Fire App operates to “present[] the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.”

CPreHBr. at 127–28 (citations omitted). For the technical prong of the domestic industry requirement for the three other Asserted Patents, DISH merely referenced this discussion.

The Commission finds that DISH did not present an indirect practice theory in a timely manner. Indeed, DISH has never disputed that it did not include an indirect practice in its pre-hearing brief. *See generally* CResp.; CBr.; CBr. (Reply). While DISH’s prehearing brief quotes the claim language that refers to playing back the media files with the media player on the end user station, the Commission finds that this is insufficient to raise the argument that the combination of the DISH Set-Top Box or a Sling App, together with a display provided by a

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DISH customer, practices the claims of the Asserted Patents. Accordingly, the Commission finds that DISH's indirect practice theory is waived under the ALJ's Ground Rule 7c.²²

The Commission rejects as unsupported DISH's contention that it implicitly raised the indirect practice theory during pre-trial proceedings.²³ While claim charts attached to the Complaint showed video signals from a domestic industry product displayed on an iPad (*see* Compl., Exh. 112, at DISH-Charts 28, 110, 210, and 281), the Complaint included no allegation of an indirect practice theory. *See* Compl. at 57–61. During the *Markman* briefing, no party presented a position as to whether the asserted claims of the Asserted Patents require (or do not require) a display or the actual display of video content.²⁴ DISH now contends that it included customer displays as part of its disclosure of domestic industry products. *See* CBr. (Reply) at 2. On September 29, 2021, pursuant to Ground Rule 6f, DISH filed its list of products and services

²² Respondents and OUII also argue that DISH's indirect practice theory was barred by the ALJ's Order No. 22, but because the Commission finds that the argument was waived under the ALJ's Ground Rules, the Commission does not reach that argument.

²³ *See, e.g.*, CBr. at 6 (“Together, these documents and images confirm a self-evident fact, which DISH raised as early as its initial complaint (*i.e.*, the domestic industry products are used with third-party televisions, phones, computers, and tablets) and maintained throughout discovery.”) (citations omitted); CBr.(Reply) at 3–4 (“To be clear, neither DISH's infringement theory nor its technical prong theory has *ever* depended on a product being used with a display because DISH has *never* taken the position that the Asserted Claims require a display. . . . DISH's position has been that, if the ALJ or the Commission adopted Respondents and the IA's belated ‘display’ theory, DISH has made clear from its initial complaint (and repeatedly since then) the self-evident fact that its [Domestic Industry Products] are used with downstream displays. The very point—the purpose—of DISH's business is to provide video to consumers so they can view it (on a display).”) (DISH's emphases).

²⁴ *See* Complainants' Initial Markman Brief, EDIS Doc. ID 750757 (Sept. 1, 2021); Respondents' Initial Markman Brief, EDIS Doc. ID 750741 (Sept. 1, 2021); Commission Investigative Staff's Initial Claim Construction Brief, EDIS Doc. ID 751939 (Sept. 17, 2021); Joint Claim Construction Chart, EDIS Doc. ID 752481 (Sept. 22, 2021).

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it planned to rely on to satisfy the domestic industry requirement.²⁵ DISH’s list included various services, servers, and set-top boxes, but DISH did not identify any customer’s displays in its list. *See, e.g.*, DISH’s List of DI Products at 1–2. DISH contends the list included displays,²⁶ apparently referring to the following: “Sling TV Service available by Sling.com website, or via client applications developed for various *smartphones, tablets, and other streaming devices* such as Android, Apple iOS, Amazon FireOS, Roku, Xbox, LG, Samsung, Comcast, JavaScript, TVOS, Chromecast, and Browsers.” *See, e.g.*, DISH’s List of DI Products at 1 (emphasis added). However, DISH identified client applications *for devices with displays*, which is different than identifying products that have displays, or identifying the customer displays themselves. Therefore, the Commission finds that DISH waived this argument by not raising it before the ALJ. *See Hazani v. U.S. Int’l Trade Comm’n*, 126 F.3d 1472, 1476 (Fed. Cir. 1997).

Respondents argue that DISH also waived its direct practice theory by not sufficiently presenting that argument in its post-hearing brief. *See* RBr. at 11 (citing Ground Rule 11). OUII further argues that DISH failed to timely present its claim construction argument that underlies that theory and therefore failed to comply with the Ground Rules and procedural schedule. *See, e.g.*, OBr. at 16. The Commission, however, finds that, on balance, DISH presented its direct practice theory and the underlying claim construction with sufficient

²⁵ Complainants’ List of Products and Services Complainants’ Will Rely on to Satisfy the Domestic Industry Requirement, EDIS Doc. ID 752992 (Sept. 29, 2021) (“DISH’s List of DI Products”); Order No. 12, at 10–11; Order No. 13 (Sept. 24, 2021).

²⁶ CBr. (Reply) at 2 (“But DISH *did* identify third-party displays in its Rule 6.f Disclosure. DISH identified the Sling Fire App as being ‘for’ devices with displays—specifically, ‘smartphones, tablets, and other streaming devices.’ *See* Ground Rule 6.f Disclosure at 1–5.”).

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particularity to satisfy the ALJ’s Ground Rules and procedural schedule. *See* CPreHBr. at 127–28; CPHBr. at 136–37 (discussion of the satisfaction of the technical prong of the domestic industry requirement under the direct practice theory), 11–25 (claim construction).

OUII further argues that the ALJ’s Order No. 22 barred DISH from arguing for a claim construction that the “presenting” and “provid[ing]” limitations do not require the end user station to have a display. *See, e.g.*, OBr. (Reply) at 4. The Commission disagrees. The ALJ’s Order No. 22 denied DISH’s motion in *limine* (“MIL”)²⁷ seeking to strike Respondents’ “display” argument as untimely as well as DISH’s motion to strike²⁸ OUII’s (and Respondents’) arguments that the claims require displays. *See* MIL No. 3 at 7–8; Mtn. to Strike at 3–4. While DISH’s motion asked the then-presiding ALJ to construe the claims such that a display is not required, Order No. 22 did not construe the claims. Indeed, the ALJ did not issue any claim construction rulings prior to the Final ID, consistent with the ALJ’s Ground Rules. *See* Order No. 12 at 10. Accordingly, the Commission finds that Order No. 22 did not bar DISH from arguing for a claim construction that the “presenting” and “provid[ing]” limitations do not require a display.

The Commission notes that, throughout the investigation, all of the parties relied on the “plain and ordinary meaning” of the relevant terms. *See, e.g.*, ROpp’n to MIL No. 3 at 8 (“Respondents are not seeking a new claim construction of these terms. Rather, Respondents

²⁷ Complainants’ Motion in Limine No. 3 to Strike Respondents’ Late and Improperly Disclosed Claim Constructions from Their Pre-Hearing and Expert Testimony, EDIS Doc. ID 763380 (Feb. 16, 2022) (“MIL No. 3”).

²⁸ Complainants’ Motion to Strike Staff’s Late and Improperly Disclosed Claim Constructions and Related Arguments from Staff’s Pre-Hearing Brief, EDIS Doc. ID 763979 (Feb. 24, 2022) (“Motion to Strike” or “Mtn. to Strike”).

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are simply applying the plain meaning of the express requirements of the claims. . . .”); Mtn. to Strike at 3. The CALJ did not reach this particular claim construction dispute because the Final ID relied exclusively on DISH’s indirect practice theory. The Commission finds that theory waived (*see supra* pp. 19–23) and must now assess whether DISH has shown that it satisfies the technical prong requirement through its direct practice theory. Because the claim construction dispute arises under the direct practice theory, that dispute is now squarely presented to the Commission, and “it is the [Commission’s] duty to resolve it.”²⁹ O2, 521 F.3d at 1362. Accordingly, the Commission turns to the issue of whether the asserted claims require a display.

3. Claim Construction

This claim construction issue relates to the “presenting” and “provid[ing]” limitations of the relevant claims, reproduced below:

Patent	Claim No.	Claim Limitation
’564 Patent	1	[1(j)] wherein the media player streams the video by: ... presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.
’156 Patent	1	[1(j)] wherein the media player streams the video by: ... presenting the video for playback by providing the requested streamlets in order of ascending start time.
’554 Patent	16	[16(j)] provide the received first streamlet for playback of the live event video.
’555 Patent	10	[10(j)] provide the received streamlets for playback of the video

²⁹ The Commission could have remanded to the CALJ for claim construction and other further proceedings as necessary, but in the interest of completing this investigation as expeditiously as practicable, it has decided the issue itself. The Commission asked the parties whether the investigation should be remanded to the CALJ for further claim construction regarding whether the “presenting” and “providing”/“provide” limitations require a display. 87 Fed. Reg. at 72511. The parties agreed that the parties’ evidence and argument was already presented in the record, and the Commission could make any necessary findings or conclusions. CBr.at 8; RBr. at 16–20; OBr. at 14–17.

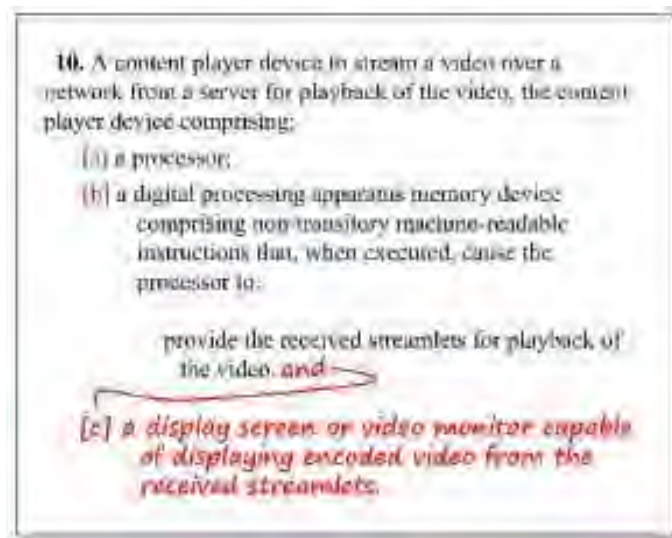
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a. The Parties' Arguments

i. DISH's Arguments

DISH's overall argument is that the specification contemplates a broad meaning of "present[ing]" that does not require visually displaying video to a user. *E.g.*, Mtn. to Strike at 17; CResp. at 5. DISH asserts that "the components of the media player 'present' received streamlets for use by other internal components." Mtn. to Strike at 17; CResp. at 8. In DISH's view, the claims "are directed to media players and software for playing media, regardless of whether there is a display connected to them or not." CResp. at 5.

More specifically, DISH argues that the asserted claims "specifically recite which hardware components are required, but never a display," pointing to claim 10 of the '555 patent, which recites only "a processor" and "a digital processing apparatus memory device." *E.g.*, CPHBr. at 13 (citing JX-0003 ('555 patent) at claim 10); *see also* CResp. at 5–6. DISH contends that Respondents and OUII improperly attempt to rewrite the claims as follows:



CResp. at 5–6.

DISH adds that "[n]either Respondents nor [OUII articulate] why 'provid[ing] the received streamlets for playback of the video' cannot be performed by the claimed 'processor'

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and ‘digital processing apparatus memory’ alone, other than to inject a requirement that Respondents and [OUII] claim DISH failed to prove.” *Id.* at 6.

DISH further argues that Respondents’ and OUII’s focus on the terms “playback” and “playing back” improperly ignores the surrounding claim language. CPHBr. at 14 (citing *Hockerson-Halberstadt, Inc. v. Converse Inc.*, 183 F.3d 1369, 1374 (Fed. Cir. 1999) (“Proper claim construction . . . demands interpretation of the entire claim in context, not a single element in isolation.”)); *see also* CResp. at 7. DISH suggests that the relevant limitations of “the ’156, ’554, and ’555 Patents merely recite ‘presenting’ or ‘provid[ing]’ data ‘for playback.’” CPHBr. at 15; *see also* CResp. at 7. As for the ’564 patent, DISH argues that while the relevant limitation recites “by playing back,” rather than “for playback,” “it specifically ties ‘playing back’ to the ‘requested media files,’ which it recites is being played back ‘with the media player,’ rather than a display.” CPHBr. at 15; *see also* CResp. at 8. DISH adds that a “person of ordinary skill in the art would readily appreciate that ‘playback’ can be achieved by all manner of ‘players’ that do not have displays, such as VCRs, DVD players, and even the Exoplayer at issue in this Investigation.” CPHBr. at 15.

DISH argues that the specifications support its position. *See, e.g.*, CPHBr. at 16–19; CResp. at 7–8. DISH asserts that the specifications do not recite the word “display,” *see* CPHBr. at 16, and the specifications explain that the components of the media player “present” received streamlets for use by “other components.” CResp. at 8 (citing JX-0001 (’564 patent) at 9:53–58 (“If the network controller module 406 has requested a streamlet 212 in multiple parts, with each part requested on mutually independent TCP/IP connections, the network controller module 406 reassembles the parts to *present* a complete streamlet 212 for use by *all other components* of the client module.”) (DISH’s emphases)); *see also* CPHBr. at 16–19.

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DISH then addresses Respondents’ and OUII’s contention (discussed below) that the specifications’ discussion of delivering content “to a user” or “viewer” requires a display. *See* CResp. at 6–7; *see also* CPHBr. at 17. DISH contends that Respondents improperly rely on certain examples in the specifications and import details of those examples into the claims. *See* CPHBr. at 17; *see also* CResp. at 6. In response to Respondents’ contention that the “purpose” of the invention supports Respondents’ and OUII’s construction, *see* CPHBr. at 18, DISH argues that “the purpose of the invention, as described in the specification, was not to improve viewing devices; rather, the invention sought to ‘alleviate the problems of reliability, efficiency, and latency’ that existed in video streaming generally.” *Id.* (quoting JX-0001 (’564 Patent) at 2:39–41). According to DISH, these “problems relate to network connectivity between client and server and bandwidth issues—not to anything relevant to the end-user’s display device,” and that “purpose is what informs the proper construction of the claims.” *Id.* DISH further reasons that, because a specification may have multiple purposes, “[n]ot every claim must contain every limitation or achieve every disclosed purpose.” *Id.* (quoting *ScriptPro LLC v. Innovation Assocs., Inc.*, 833 F.3d 1336, 1342 (Fed. Cir. 2016)).

DISH next addresses the extrinsic evidence. CPHBr. at 20–25. According to DISH, “the only expert testimony of record, from DISH’s technical expert Dr. Negus, confirms [that] the claims do not require a display.” *Id.* at 20 (citing Tr. (Negus) 151:9–11 (declaring that “the claims do not recite any requirement of a display, of a physical display, for example, within the claims”))). According to DISH, none of “Respondents’ experts provided any testimony rebutting Dr. Negus’s understanding of how a person of ordinary skill in the art would understand the claim limitations.” *Id.* DISH alleges that Respondents mischaracterize testimony from the co-inventors, Messrs. Major and Hurst, by suggesting that their testimony

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related to the claims’ requirements (*i.e.*, claim construction), when it was actually just an acknowledgment that “playing back content may also result in displaying that content on a screen.” *See id.* at 20–21. Regardless, DISH notes that inventor testimony about claim construction is “of minimal, if any, probative value.” *Id.* at 21 (citing, *inter alia*, *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1370 n.5 (Fed. Cir. 2003)).

As to Respondents’ dictionary definitions, DISH first asserts that those definitions were not contemporaneous in time with the Asserted Patents and thus should be given no weight. CPHBr. at 21. Second, DISH notes that Respondents omitted any definition of the word “provide,” whose definitions include: (1) “make available for use; supply” and “present or yield (something useful),” New Oxford American Dictionary, 2nd ed. (2005), and (2) “to make ready beforehand” and “to prepare for future use,” Chambers Dictionary, 10th ed. (2006). *Id.* According to DISH, these “contemporaneous definitions, on the other hand, confirm that ‘provide’ can be broader than ‘present’ and merely requires that the streamlet be made ‘read[y]’ for or supplied for ‘future’ playback, which supports DISH’s view of the claims.” *Id.* (bracketed material not in original).

Finally, DISH urges rejection of Respondents’ and OUII’s argument that DISH’s Complaint narrows the scope of the claims to require a display on the grounds that there is no authority for using exemplary illustrations in claim charts to limit claim scope. *See id.* at 22–24.

ii. Respondents’ Arguments

Respondents argue that their construction—that the claims require a display—is supported by the plain claim language. *E.g.*, ROpp’n to Mtn. to Strike at 9–10; RPet. at 21–22. Respondents first focus on claim 1 of the ’564 patent:

Here, all of the Asserted Claims are apparatus claims that must present video. For example, the Asserted Claims of the ’564 patent recite “[a]n end user station for adaptive-rate content streaming of digital content

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from a video server over a network . . . comprising: a media player operating on the end user station . . . wherein the media player streams the video by . . . *presenting the video by playing back* the requested media files with the media player on the end user station.” JX-0001 (’564 patent) at claim 1; ID at 10–11.

RPet. at 21 (Respondents’ emphasis and ellipses). To Respondents, “[t]he plain and ordinary meaning of this limitation, which is supported by the totality of the intrinsic and extrinsic evidence, requires presenting that video by playing on the claimed apparatus (the end user station) such that the user may view the video.” *Id.* at 21; *see also* ROpp’n to Mtn. to Strike at 9. Respondents add that “the video, of course, cannot be viewed on an end user station by a user without a visual display of that video.” RPet. at 21; *see also* ROpp’n to Mtn. to Strike at 9.

With respect to claim 16 of the ’554 patent and claim 10 of the ’555 patent, which recite “provid[ing] the . . . streamlet[] for playback,” Respondents argue that these limitations require “presenting the video because the patents make clear that ‘providing’ video for playback is tantamount to ‘presenting’ the video.” ROpp’n to Mtn. to Strike at 10; *see also* RPet. at 7. Respondents reason that this is “clear from claim 1 of the ’156 patent, which recites ‘presenting the video for playback by providing the requested streamlets in order of ascending start time.’” ROpp’n to Mtn. to Strike at 10; *see also* RPet. at 7. Respondents contend that the “language in the ’156 patent makes clear that ‘providing’ is just a form of ‘presenting’ the streamlets.” ROpp’n to Mtn. to Strike at 10; *see also* RPet. at 7.

Next, Respondents point to the specifications, primarily the ’564 patent specification. *See* ROpp’n to Mtn. to Strike at 11–12; *see also* RPet. at 21–22. Respondents argue that the ’564 patent specification states that the invention is intended to “offer instantaneous viewing.” ROpp’n to Mtn. to Strike at 11–12 (quoting JX-0001 (’564 patent) at 2:39–44); *see also* RPet. at 21–22. Respondents add that the specification declares that the end user station is “configured to present content.” ROpp’n to Mtn. to Strike at 11–12 (citing JX-0001 (’564 patent) at 6:3–

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17). Respondents contend that the specification makes clear that the verb “present” is used “pursuant to its ordinary meaning in the context of video by referring to the making of a ‘presentation,’ which . . . cannot happen without a screen on which the presentation is shown.” *Id.*; *see also* RPet. at 21. Respondents further reason that the specification “explicitly states that the alleged invention is motivated by this very concern about the quality of the ‘presentation’ when viewed by the user.” ROpp’n to Mtn. to Strike at 11–12 (citing JX-0001 (’564 patent) at 2:4–5); *see also* RPet. at 21–22 (citing JX-0001 (’564 patent) at 1:31–27, 2:39–44). Further, according to Respondents, the specification “confirms that ‘playing’ the video has its ordinary visual meaning in the context of video. For example, the specification says that ‘playing video’ is how the video is delivered ‘to the end user.’” ROpp’n to Mtn. to Strike at 12 (citing JX-0001 (’564 patent) at 11:55–57 (“[D]elivering 614 streamlets to the end user comprises playing video and[/]or audio streamlets on the viewer 408.”); JX-0003 (’555 patent) at 12:23–30 (“[P]laying just a thumbnail view of the stream.”)); *see also* RPet. at 21–22.

Respondents then address DISH’s arguments regarding the intrinsic evidence. *See* ROpp’n to Mtn. to Strike at 12–13. In response to DISH’s argument that “present” can mean that one component of the media player merely makes a signal available to another component, Respondents declare that the “specification makes clear that in the context recited by the claims—the playing of a video, as opposed to the mere downloading or storing of a video—the verb ‘present’ refers to a visual presentation.” *Id.*; *see also* RPet. at 21–22. Respondents further reason that DISH’s evidence is “inapposite to the claims, which recite the *media player* (*i.e.*, the ‘viewer’) is the component that ‘present[s] the video *by playing back* the requested media files’ ([JX-0001 (’564 patent) at claim 1 (Respondents’ emphasis)]) or ‘present[s] the video for playback’ ([JX-0004 (’156 patent) at claim 1]). ROpp’n to Mtn. to Strike at 12. To

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Respondents, the “claims are clearly not talking about transmitting a signal from one internal component to another, such as from a network controller to a storage memory, but rather require presenting the video by playing it on the media player, which the patents themselves call the “viewer.” *Id.* at 12–13 (citing JX-0001 (’564 patent) at 8:26–27); *see also* RPet. at 21–22. Thus, according to Respondents, the specifications make clear that “presenting,” as used in the claims, is used pursuant to its ordinary meaning of visual presentation. ROpp’n to Mtn. to Strike at 13; *see also* RPet. at 21.

iii. OUII’s Arguments

OUII argues that the plain and ordinary language of the claims require a display. *See, e.g.,* OPreHBr. at 149–50; OOpp’n to Mtn. to Strike at 2–8. OUII further argues that DISH treated claim 1 of the ’564 patent as representative of all asserted claims, and that the language of that claim unambiguously requires a display. *See* OOpp’n to Mtn. to Strike at 8; OBr. at 8–10. Thus, according to OUII, DISH cannot argue that the relevant claims have different scope. *See* OOpp’n to Mtn. to Strike at 8; OBr. at 8–10.

b. The Commission’s Determination

The parties do not dispute that the domestic industry products do not have displays; therefore, resolution of this claim construction issue is dispositive of whether DISH satisfied the technical prong requirement for each patent. For their part, Respondents and OUII assert that the plain and ordinary meaning of the claims requires a display. RBr. at 4, 6–14; OPreHBr. at 149–50. Complainants, on the other hand, argue that the plain and ordinary meaning does not require a display. *E.g.,* CResp. at 5.

As an initial matter, the Commission notes that Respondents and OUII rely heavily on the language of claim 1 of the ’564 patent and argue that claim 1 is representative of all the other claims of all four patents. *See, e.g.,* RBr. at 7–8; OOpp’n to Mtn. to Strike at 8; OBr. at 8–

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10. However, DISH did not treat the language of claim 1 of the '564 patent as representative of the language of all asserted claims for claim construction purposes, as OUII contends. *See* CPHBr. at 11–25. Moreover, the claim language of the asserted claims is sufficiently different to require a separate analysis for each patent. The Commission therefore addresses the claims of each patent separately.

For the reasons discussed below, the Commission concludes that the asserted claims of the '554, '555, and '156 patent do not require a display, but the asserted claims of the '564 patent do. As the Final ID found that all limitations other than the “presenting” and “provid[ing]” limitations are met by the domestic industry products (*see* Final ID at 102–07, 113–14, 129–34, 146–54), the Commission finds that DISH’s domestic industry products practice claims 16 and 17 of the '554 patent, claims 10, 11, and 14 of the '555 patent, and claims 1 and 4 of the '156 patent, but not claims 1, 3, and 5 of the '564 patent.

i. The '554 Patent

The Commission finds that the claims of the '554 patent on which DISH relies to show a domestic industry do not require a display. Independent claim 16 reads as follows:

[16pre] An end user station to stream a live event video over a network from a server for playback of the video, the content player device comprising:

[16a] a processor;

[16b] a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

[16c] establish one or more network connections between the end user station and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

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- [16d] wherein the live event video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream, each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the live event video;
- [16e] wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and
- [16f] wherein the first streamlets of each of the low quality stream, the medium quality stream and the high quality stream each has an equal playback duration and each of the first streamlets encodes the same portion of the live event video at a different one of the different bitrates;
- [16g] select a specific one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams;
- [16h] place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;
- [16i] receive the requested first streamlet from the server via the one or more network connections; and
- [16j] *provide the received first streamlet for playback of the live event video.*

JX-0002 ('554 patent) at claim 16 (emphasis added).³⁰ DISH relies on claim 16 and dependent claim 17 for purposes of satisfying the domestic industry requirement.

³⁰ The limitations of claim 16, and of the other claims discussed below, have been separated and labeled for clarity.

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The Commission initially notes that it affirms the Final ID’s finding that the preamble of claim 16 is not limiting for the reasons explained in the Final ID. *See* Final ID at 66–68, 135.

The Commission then turns to, and centers its analysis on, the claim language itself. *See Innova/Pure Water*, 381 F.3d at 1116. First, neither independent claim 16 nor dependent claim 17 explicitly recites a display. The only hardware recited by claims 16 and 17 is a “processor” and a “digital processing apparatus memory device.” Second, element 16j recites that the instructions on the memory device cause the processor to “provide the received first streamlet for playback of the live event video.” Applying the plain and ordinary meaning, “provide the received first streamlet” is naturally read to mean the digital processing apparatus memory device is sending the received first streamlet to another component “for playback of the live event video.” This language does not suggest that there is a requirement that the “digital processing apparatus memory device” or “processor” contain a display that shows the live video. Nor does claim 16 recite that the video is actually played back; rather, it merely recites that the first streamlet is “provide[d] . . . for playback.” This implies that the streamlet is provided for a purpose, *i.e.*, for playback. The component that performs any playback of the streamlet permissibly remains unclaimed as claims need not recite every component of an apparatus. *Blackbird Tech LLC v. ELB Elecs., Inc.*, 895 F.3d 1374, 1379 (Fed. Cir. 2018).

Moreover, claim 22, which depends on claim 16, recites that “when played back,” the streamlets “appear live to a viewer.” The phrase “appear live to the viewer” suggests that the user will be able to actually see the video when it is actually played back. This language is consistent with the Commission’s conclusion that “providing for playback” does not require a display that actually shows the video to the viewer. Dependent claim 22 adds something more,

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“when played back,” and then specifies what the viewer actually sees. On the other hand, claim 16 does not require anything about the viewer viewing the video.

“The specification usually is the best guide to the meaning of the term,” and here the specification supports the Commission’s reading of claim 16 as not requiring a display.

Phillips, 415 F.3d at 1315. The specification repeatedly describes a component that receives streamlets and then provides the streamlets to a “viewer,” which then plays back the video for the user. JX-0002 (’554 patent) at 16:51–56 (“In one embodiment, the staging module 709 then arranges 912 the streamlets 304 into the proper order, and the agent controller module 702 *delivers 914 the streamlets to the viewer 708.*” (emphasis added)), 13:7–10 (“In one embodiment, the agent controller module 702 is configured to interface with a viewer 708, *and transmit streamlets 304 to the viewer 708.*” (emphasis added)). While claim 16 did not use the “agent controller module” terminology from the specification, it certainly claims the related functionality of transmitting streamlets to another component, the viewer 708, which is not recited in claim 16. Accordingly, this description in the specification is consistent with interpreting the limitation “provid[ing] the received first streamlet” to mean providing the received first streamlet to an (unclaimed) component that would perform any actual playback of the live event video. This part of the specification shows that playing video and audio streamlets on the viewer 708 is a “further embodiment” that the patentee chose not to claim, and it also confirms that the patentee knew how to claim the function of playing video and audio streamlets on a viewer that contains a display had she wanted to do so. JX-0002 (’554 patent) at 16:51–56 (“In a further embodiment, delivering 914 streamlets 304 to the end user *comprises playing video and or audio streamlets on the viewer 708.*” (emphasis added)). A display permissibly remains unclaimed. *See Blackbird*, 895 F.3d at 1379.

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Further, the specification contemplates an embodiment in which the streamlets are reassembled and transferred to an external device. *Id.* at 13:7–13 (“In one embodiment, the agent controller module 702 is configured to interface with a viewer 708, and transmit streamlets 304 to the viewer 708. *Alternatively, the agent controller module 702 may be configured to simply reassemble streamlets into a single file for transfer to an external device such as a portable video player.*” (emphasis added)). The Commission’s construction of claim 16, which simply requires providing the streamlet to an (unclaimed) component, is consistent with this embodiment.³¹

Lastly, the Commission notes that the extrinsic evidence presented by the parties for claim construction is not particularly probative. As for dictionary definitions argued by the parties, neither Respondents nor OUII offered a dictionary definition for the claim term “provide” in asserted claim 16. *See* ROpp’n to Mtn. to Strike at 13–14; RPHB at 94–97; OOpp’n to Mtn. to Strike at 1–15; OPHB at 149–57. Respondents argue that “the ordinary meaning of ‘present’ in this context” has a “visual meaning,” relying on definitions in the Merriam-Webster and Google dictionaries. ROpp’n to Mtn. to Strike at 13. Respondents appear to treat the terms “present” and “provide” as equivalent. Moreover, the Commission finds that, as DISH points out, the online definitions supplied by Respondents—dated in 2022—are not contemporaneous in time with the Asserted Patents and are therefore not particularly probative. *See* CPHBr. at 21 (citing *Brookhill-Wilk I, LLC. v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1299 (Fed. Cir. 2003) (declining to consider references dated “well after” the patent)). Moreover, the definition of the term “present” is not relevant for the ’554 patent and the ’555

³¹ The parties do not rely on the prosecution history, and the Commission does not find the prosecution history to be probative here.

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patents because the claims of those patents do not use the term “present.” DISH, on the other hand, provides contemporaneous definitions of the term “provide,” which is used in the ’554 patent, that are consistent with the Commission’s interpretation of the plain and ordinary meaning. Those definitions include: (1) “make available for use; supply” and “present or yield (something useful),” New Oxford American Dictionary, 2nd ed. (2005), and (2) “to make ready beforehand” and “to prepare for future use,” Chambers Dictionary, 10th ed. (2006). Respondents did not object to DISH’s citation to and reliance on these dictionary definitions. *See* RPHBr. (Reply) at 28–39.

In terms of testimony, DISH relies on expert testimony that the “claims do not recite any requirement of a display, of a physical display, for example, within the claims,” CPHBr. at 13 (citing Tr. (Negus) at 151:4–11). The Commission finds that this testimony is too conclusory to be persuasive. Respondents argue that Mr. Major, a named inventor, testified that “in the context of these patents, ‘playback’—a term recited in the claims—requires displaying video.” ROpp’n to Mtn. to Strike at 10 n.4. However, inventor testimony about claim construction is of minimal, if any, probative value. *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1370 n.5 (Fed. Cir. 2003); *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379 (Fed. Cir. 2000); *Howmedica Osteonics Corp. v. Wright Med. Tech., Inc.*, 540 F.3d 1337, 1347 (Fed. Cir. 2008). Accordingly, the Commission does not rely on the extrinsic evidence to change the plain and ordinary meaning of the claim language. *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1382 (Fed. Cir. 2008) (“A court may look to extrinsic evidence so long as the extrinsic evidence does not contradict the meaning otherwise apparent from the intrinsic record.”).

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* * *

Respondents make a number of additional arguments, none of which the Commission finds persuasive. First, Respondents argue that the “provide” function is performed by the “content player device,” and that the “plain language of a ‘content player device’ makes clear that it is the device that plays content, and not merely a network controller component that provides the streamlet to some other device that plays it, contrary to DISH’s suggestions.” ROpp’n to Mtn. to Strike at 10; RPHBr. at 94. However, the “content player device” language appears only in the non-limiting preamble, and thus Respondents’ argument has no merit. Moreover, the express claim language recites “a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to: . . . provide the received first streamlet for playback of the live event video.” The claim does not recite that a “content player device” “plays” anything.

Respondents further argue that the specifications of the Asserted Patents “confirm that the plain meaning of [the disputed limitation] requires presenting video to a user such that the user is viewing the video, which cannot happen without a visual presentation.” ROpp’n to Mtn. to Strike at 11. Respondents point to the specification’s statement that “[s]treaming media” refers to technology that delivers content at a rate sufficient for presenting the media to a user in real time as the data is received,” such that “[t]he user has the immediate satisfaction of viewing the requested content without wading [sic] for the media file to completely download.” *Id.* (quoting JX-0001 (’564 patent) at 1:31–37) (citing also JX-0001 (’564 patent) at 2:39–44).³² However, the purpose of the invention, as described in the specification, was not to improve

³² Respondents’ quoted language from the ’564 patent can also be found in the ’554 patent. JX-0002 (’554 patent) at 1:47–52.

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viewing devices; rather, the invention sought to “alleviate the problems of reliability, efficiency, and latency” that existed in video streaming, *i.e.*, content delivery, generally. JX-0002 (’554 patent) at 2:58–60 and 1:47-49. Moreover, because an invention may have multiple purposes, “[n]ot every claim must contain every limitation or achieve every disclosed purpose.”

ScriptPro LLC v. Innovation Assocs., Inc., 833 F.3d 1336, 1342 (Fed. Cir. 2016). There is nothing in the specification that mandates or even suggests that the alleged purpose of real-time viewing of the delivered content or an unclaimed display must be read into these claims.

Respondents also argue that Figure 1 of the ’554 patent (reproduced below) shows that the “end user station” includes a display. ROpp’n to Mtn. to Strike at 11.

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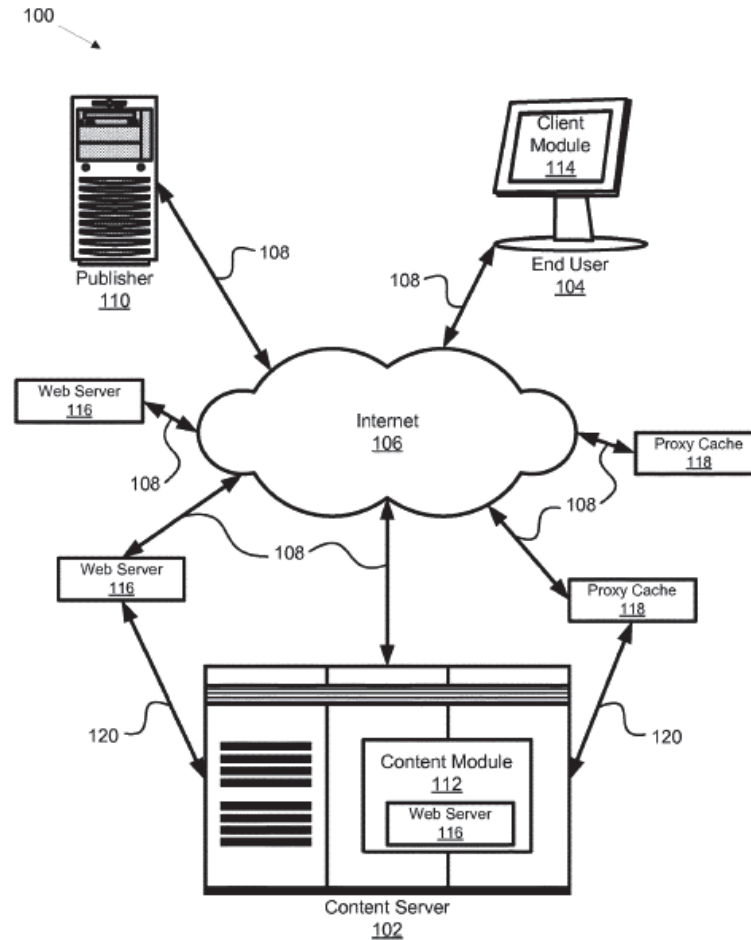


FIG. 1

However, the description of even “a preferred embodiment, in the absence of a clear intention to limit claim scope [to that embodiment] is an insufficient basis on which to narrow the claims.”

Decisioning.com, 527 F.3d at 1314. Here, there is no indication of an intention to limit the claim scope as Respondents seek. Moreover, the patent states that “[t]he end user station 104 may comprise a personal computer (PC), an entertainment system configured to communicate over a network, or a portable electronic device configured to present content” and that “portable electronic devices may include, but are not limited to, cellular phones, portable gaming systems, and portable computing devices.” JX-0002 (’554 patent) at col. 6: 44–50. Accordingly, the

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patent teaches a number of different devices that can constitute an “end user station,” none of which look like the end user station in Figure 1, and not all of them have built in displays, for example, the personal computer. In contrast, the patentee limited other claims to require that content “when played back, appear live to a viewer.” *See* JX-0002 (’554 patent) at claim 22. Setting aside whether such contrasting claim language requires actual viewing, claim 16 recites “for playback” with no language indicative that real-time viewing of the delivered content or a display is required.

Finally, Respondents argue that DISH (via the claim charts attached to DISH’s Complaint) acknowledged that the asserted claims require a display, and thus DISH implicitly conceded that the claims require a display. *E.g.*, RBr. at 9. The Commission disagrees. DISH states that it included depictions of displays in the Complaint because it is much more tangible to discuss the benefits of the patented technology in the visual context of its products when used with displays. CBr. (Reply) at 6. The Commission agrees that these depictions were for clarity in discussing the technology in general and are not evidence that the claims at issue require a display.

Neither Respondents nor OUII contend that the additional limitations of dependent claim 17 require a different conclusion for those claims. Accordingly, the Commission finds that the claims of the ’554 patent asserted for the technical prong of the domestic industry requirement do not require a display.

ii. The ’555 Patent

The Commission also finds that the claims of the ’555 patent on which DISH relies to show a domestic industry do not require a display. Claim 10 reads as follows:

[10pre] A content player device to stream a video over a network from a server for playback of the video, the content player device comprising:

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- [10a] a processor;
- [10b] a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:
- [10c] establish one or more network connections between the client module and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;
- [10d] wherein the video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream, wherein each of the low quality stream, the medium quality stream, and the high quality stream comprises a streamlet that encodes the same portion of the video at a different one of the plurality of different bitrates;
- [10e] wherein at least one of the low quality stream, medium quality stream, and high quality stream is encoded at a bit rate of no less than 600 kbps; and
- [10f] wherein the streamlet encoding the same portion of the video in the low quality stream has an equal playback duration as the streamlet encoding the same portion of the video in the high quality stream;
- [10g] select a specific one of the streams based upon a determination by the client module to select a higher or lower bitrate version of the streams;
- [10h] place a streamlet request to the server over the one or more network connections for the selected stream;
- [10i] receive the requested streamlets from the server via the one or more network connections; and
- [10j] *provide the received streamlets for playback of the video.*

JX-0003 ('555 patent) at 19:45–20:19 (emphasis added). DISH relies on claim 10 and dependent claims 11 and 14 for satisfying the domestic industry requirement.

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The Commission initially notes that, while the Final ID said that “[n]o party . . . explained why any limiting effect of the preamble is relevant to any issue,” the Final ID found that, “[t]o the extent such a determination is necessary, . . . the preamble of claim 10 is limiting.” Final ID at 153. To the extent the Final ID found that the preamble of claim 10 is limiting, the Commission reverses that finding. The Commission finds that the preamble of claim 10 of the ’555 patent is not limiting for the same reasons the Final ID found that the preamble of claim 16 of the ’554 patent is not limiting. *See* Final ID at 66–68. Namely, the body of claim 10 recites a structurally complete invention: a processor, a memory device, and instructions that enable streaming video over a network from a server. *See id.*; *Intirtool, Ltd. v. Texar Corp.*, 369 F.3d 1289, 1295 (Fed. Cir. 2004) (“If the body of the claim describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention, the preamble is generally not limiting unless there is clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art.” (internal quotations omitted)); *Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1358–59 (Fed. Cir. 2010) (“[T]he claim drafters did not rely on the preamble language to define or refine the scope of the asserted claims.”).

Moreover, the preamble of claim 10 is duplicative of limitations recited in the claim body. *See Symantec Corp. v. Computer Assocs. Int’l, Inc.*, 522 F.3d 1279, 1289 (Fed. Cir. 2008) (declaring that, when the preamble “is reasonably susceptible to being construed to be merely duplicative of the limitations in the body of the claim,” it is “not construe[d] to be a separate limitation”); *see also* Final ID at 68. For example, the preamble states that the purpose of the invention is to “stream a video over a network from a server for playback of the video,” and the body of the claim also specifies the content is “receive[d] . . . from the server via the one

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or more network connections” and “provide[ed] . . . for playback of the video.” Additionally, the preamble term “content player device” does not appear in the body of the claim.

Accordingly, the preamble of claim 10 of the ’555 patent is not limiting.

As to the disputed claim language itself, the Commission notes that it is very similar to the disputed language in claim 16 of the ’554 patent, discussed above, and the two patents share a specification. Accordingly, the same analysis generally applies. *See Innova/Pure Water*, 381 F.3d at 1116.

Again, none of the relevant claims explicitly recite a display. The only hardware recited by the claims is a “processor” and a “digital processing apparatus memory device.” In addition, regarding claim 10j’s recitation of the limitation “provide the received streamlets for playback of the video,” the plain and ordinary meaning of the phrase “provide the received streamlets” is naturally read to require sending the received streamlets to an (unclaimed) component “for playback of the video.” This language does not suggest that there is a requirement that the digital processing apparatus memory device or processor has a display. Moreover, claim 10 does not recite that the video is actually played back, instead it merely recites that the received streamlets are “provide[d] . . . for playback.” The component that would perform any playback of the streamlet permissibly remains unclaimed. *See Blackbird*, 895 F.3d at 1379. Nor, in contrast to other claims in the ’555 patent, does claim 10 specify that content “appear[s] live to a viewer.” For example, dependent claim 17 requires that “when played back,” the streamlets “appear live to a viewer.” *See JX-0003* (’555 patent) at claim 17.

Further, the specification supports the Commission’s conclusion that the asserted claims of the ’555 patent do not require a display, and “the specification usually is the best guide to the meaning of the term.” *Phillips*, 415 F.3d. at 1315. As discussed above, the specification

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repeatedly describes a component receiving streamlets, then providing the streamlets to a “viewer,” which then plays back the video for the user. JX-0003 (’555 patent) at 16:51–56, 13:7–10. This is consistent with interpreting the limitation “provid[ing] the received streamlets” to mean providing the streamlets to an (unclaimed) component that would perform any actual playback of the video. In addition, it shows that the patentee knew how to claim the function of playing video and audio streamlets on a viewer when she wanted to do so. Moreover, the specification contemplates an embodiment in which the streamlets are reassembled and transferred to an external device, which is consistent with the Commission’s construction of the claim as simply requiring that the streamlets be provided to an (unclaimed) component for playback. *Id.* at 13:7–13.

The Commission further notes that, for the same reasons discussed above, the extrinsic evidence presented by the parties for claim construction is not particularly probative. Respondents’ arguments regarding the ’555 patent are unpersuasive for the same reasons, noted above, for the ’554 patent. *See supra*, Part IV.b.i.

Neither Respondents nor OUII contend that the additional limitations of dependent claims 11 and 14 require a different conclusion for those claims. For all of these reasons, the Commission finds that the claims of the ’555 patent relied upon by DISH for the technical prong of the domestic industry requirement do not require a display.

iii. The ’156 Patent

The Commission finds that the claims of the ’156 patent on which DISH relies to satisfy the domestic industry requirement also do not require a display. Independent claim 1 reads as follows:

[1pre] An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising;

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- [1a] a media player operating on the apparatus, wherein the media player is configured to stream the video from the video server via at least one transmission control protocol (TCP) connection over the network,
- [1b] wherein the video server stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets,
- [1c] wherein each of the streamlets yields a different portion of the video on playback,
- [1d] wherein the streamlets across the different copies yield the same portions of the video on playback, and
- [1e] wherein the streamlets in the different copies are aligned in time such that the streamlets that play back the same portion of the video for the different copies each begin at the same playback time in relation to the beginning of the video, and
- [1f] wherein the media player streams the video by: requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server,
- [1g] wherein the sequential streamlets are selected by the media player from the based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video;
- [1h] repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video;
- [1i] adapting the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time; and
- [1j] *presenting the video for playback by providing the requested streamlets in order of ascending start time.*

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JX-0004 ('156 patent) at claim 1 (emphasis added). DISH relies on claim 1 and dependent claim 4 to satisfy the domestic industry requirement.

Initially, the Final ID observed that the parties did not dispute whether the preamble to claim 1 is limiting. *See* Final ID at 115. The Final ID found that “[t]o the extent that the preamble is limiting,” the Accused Products satisfy the preamble. *See id.* Like the Final ID, the Commission also takes no position as to whether the preamble is limiting and notes that no party rests its arguments upon the preamble.

Turning to the disputed claim language itself, none of the asserted claims of the '156 patent explicitly recite a display (similar to the case for the claims of the '554 and '555 patents). Limitation 1j recites “presenting the video for playback by providing the requested streamlets in order of ascending start time.” Applying the plain and ordinary meaning, the Commission finds the phrase “presenting the video for playback *by providing*” is naturally read to mean sending the requested streamlets to an unclaimed component for playback. This language does not suggest that there is a requirement that the media player display those streamlets on a display of its own. The patentee chose to qualify the term “presenting” with the term “providing” in claim 1. Accordingly, to the extent the term “presenting” has a visual context, as alleged by Respondents, the patentee here specifically chose to limit that term to providing the requested streamlets. ROpp’n to Mtn. to Strike at 11 (arguing that the specification “makes clear that the verb ‘present’ is used pursuant to its ordinary meaning in the context of video by referring to the making of a ‘presentation,’ which, of course, cannot happen without a screen on which the presentation is shown”) (citing JX-0001 ('564 patent) at 1:37–39).³³ Moreover, the claims show

³³ Respondents’ quoted language from the '564 patent can also be found in the '156 patent. JX-0004 ('156 patent) at 1:47–50.

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that, when the patentee wanted to claim *playing* the video, it did so by explicitly reciting that the video is actually played back, as in unasserted independent claim 13, which requires “presenting the video *by playing back the requested media*.” JX-0004 (’156 patent) at claim 13.

Respondents argue, in relation to claim 1 of the ’156 patent (as well as claim 1 of the ’564 patent), that the fact that “these claims specifically recite that the ‘media player’ is performing the ‘presenting’ step confirms the plain language of the claims because the ‘media player’ is a type of ‘viewer’ that displays the video.” ROpp’n to Mtn. to Strike at 9–10 (quoting JX-0004 (’156 patent) at claim 1 and citing JX-0001 (’564 patent) at 8:26–27)). To Respondents, “[t]he claims are clearly not talking about transmitting a signal from one internal component to another, such as from a network controller to a storage memory, but rather require presenting the video by playing it on the media player, which the patents themselves call the ‘viewer.’” *Id.* (citing (JX-0001 (’564 patent)) at 8:26–27).³⁴

Respondents’ argument is premised on their assumption that their claim construction position is correct, *i.e.*, that the recited media player of claim 1 requires hardware that contains a display and is itself a viewer. Claims 1 and 4, however, do not recite a display or a viewer. Rather, they claim an apparatus comprising a “media player” that “operat[es] on the apparatus” and “is configured to stream the video” by carrying out several functions recited in the claim. This claim language does not require that the media player have any particular hardware; it must only be configured to carry out the recited limitations to satisfy the claim. The Commission further notes that the apparatus on which the media player operates may contain a display or other hardware, but the Commission finds that none of that hardware, including a display, is

³⁴ Respondents’ citation to the ’564 patent can also be found in the ’156 patent. JX-0004 (’156 patent) at 8:46–48.

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claimed or required by the claims. *See Blackbird Tech*, 895 F.3d at 1379. Further, the specification, does not teach that the “media player” necessarily contains a screen or display. Respondents point to one embodiment in the specification, which states that: “The viewer 408 may be a media player (not shown) *operating on* a PC or handheld electronic device.” JX-0004 (’156 patent) at 8:46–48 (emphasis added). The Commission reads that embodiment to mean that a viewer may be a media player and that the media player is software that runs on a device. It does not read that embodiment to mean that a media player must be a viewer or a device containing a screen or display.

The Commission acknowledges that the patent specification describes another type of media player, a “portable media player,” and states that “[m]any portable media players are equipped with network connections and enabled [to] play music or videos.” JX-0004 (’156 patent) at 1:35–37. However, these types of portable media players described in this portion of the specification contain hardware and software and are distinguishable from the claimed “media player” of claim 1 as noted above. Moreover, the patentee explained that the functional units described in the specification are referred to as modules, and can be hardware, software, or a combination of both. JX-0004 (’156 patent) at 5:24–54. The media player of claims 1 and 4 is such a functional unit.

The specification further supports the Commission’s conclusion that the asserted claims of the ’156 patent do not require a display. *Phillips*, 415 F.3d at 1315. Here, the specification in one embodiment describes a component receiving streamlets, then providing the streamlets to a “viewer,” which in one preferred embodiment then plays back the video for the user. JX-0004 (’156 patent) at 12:11–16 (“In one embodiment, the staging module 409 then arranges 612 the streamlets into the proper order, and the agent controller module 402 *delivers 614 the streamlets*

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to the viewer 408. In a further embodiment, delivering 614 streamlets to the end user comprises playing video and or audio streamlets on the viewer 408. (emphasis added)); *see also id.* at 3:13–15 (identifying a “staging module” on the logic unit of the apparatus configured to stage the streamlets and arrange the streamlets for playback on a content player). Playing the video streamlets on the viewer 408 as described in this embodiment is consistent with the Commission’s interpretation of the media player as software because the media player (software) of claim 1 “present[s] the video for playback by providing the requested streamlets in order of ascending start time” such that the streamlets, as so arranged by the media player, can be played back on an unclaimed content player. Moreover, the specification describes playback as being performed on a “content player,” not a “media player,” *see id.* at 3:13–15. A content player, unlike a “media player,” is hardware. *See* Final ID at 69–71. Furthermore, the specification is consistent with the Commission’s interpretation of “presenting” by “providing the requested streamlets” to mean providing the streamlet to an (unclaimed) component that would perform any actual playback.

For the same reasons discussed above, the extrinsic evidence presented by the parties for claim construction is not particularly probative here.

The Commission does not find persuasive Respondents’ remaining arguments, many of which were disposed of above. Respondents argue that the “the ordinary meaning of ‘present’ in this context” has a “visual meaning,” relying on definitions in the Merriam-Webster and Google dictionaries. ROpp’n to Mtn. to Strike at 13. However, the Commission finds that, as DISH points out, the online definitions supplied by Respondents—dated in 2022—are not contemporaneous in time with the Asserted Patents and are therefore not particularly probative.

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See CPHBr. at 21 (citing *Brookhill-Wilk I*, 334 F.3d at 1299 (declining to consider references dated “well after” the patent)).

Respondents argue that a “person of skill, or any person with common sense that has watched a video, would have understood that ‘presenting the video by playing back’ requires a visual presentation of the video.” ROpp’n to Mtn. to Strike at 9. Respondents conflate the language in claim 1 of the ’564 patent with the language of this claim, which defines “presenting” as “providing the requested streamlets.” Moreover, as discussed above, the claims do not recite a “display,” and the Commission cannot amend the claims based on Respondents’ “common sense.” Rather, the patentee chose how to define their patent right and had a good reason to claim the invention without a display.

Neither Respondents nor OUII contend that the additional limitations of dependent claim 4 require a different conclusion for that claim. Accordingly, the Commission finds that claims 1 and 4 of the ’156 patent do not require a display.

iv. The ’564 Patent

Unlike the three other asserted patents discussed above, the Commission finds that independent claim 1 of the ’564 patent does require a display. Independent claim 1 reads as follows:

[1pre] An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

- [1a] a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,
- [1b] wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,

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- [1c] wherein each of the files yields a different portion of the video on playback,
- [1d] wherein the files across the different copies yield the same portions of the video on playback, and
- [1e] wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and
- [1f] wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;
- [1g] automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,
- [1h] the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;
- [1i] making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and
- [1j] *presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.*

JX-0001 ('564 patent) at 13:20–61 (emphasis added). DISH relies on claim 1 and dependent claims 3 and 5 for satisfying the domestic industry requirement.

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The Commission notes that the parties stipulated that the preamble of claim 1 is limiting. Final ID at 80. The Commission adopts that stipulation and treats the preamble as limiting.

As to the claim language itself, the Commission notes that, like the other asserted claims, neither independent claim 1 nor dependent claims 3 or 5 explicitly recites a display. Independent claim 1, however, requires that the media player “present[] the video by *playing back* the requested media files with the media player *on the end user station*.” While the media player is operating in largely the same way as in claim 1 of the ’156 patent—that is, as software that arranges streamlets—claim 1 of the ’564 patent further requires that the video be played back with the media player *on the end user station*. Applying the plain and ordinary meaning, the Commission finds that “presenting the video by playing back the requested media files with the media player on the end user station” is naturally read to require that the video actually be shown on a display that forms part of the claimed end user station.

Moreover, the claim language expressly requires presentation of the video “by playing back the requested media files,” rather than claiming presentation of the video “by providing the requested streamlets” or presenting a streamlet “for use by all other components.” *Compare* JX-0001 (’564 patent) at claim 1 (“presenting . . . *by playing back*” (emphasis added)), *with* JX-0004 (’156 patent) at claim 1 (“presenting . . . *by providing for playback*”) (emphasis added). Thus, this claim’s express requirement of presenting the video “by playing back . . . on the end user station” indicates that the video must be shown on a display to meet the limitation. Further, in contrast to the claim language of the ’156 patent, which refers to presenting the streamlets “for playback,” the claim language of the ’564 patent refers to actually playing back the streamlets and doing so on the end user station. Nothing in the ’564 patent specification runs

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counter to the Commission’s conclusion that the asserted claims of the ’564 patent require a display.

The Commission finds none of DISH’s arguments persuasive for this claim. DISH argues that the “playback” function is performed by executing software, namely the “media player,” and that the “plain and ordinary meaning of ‘playback’ . . . certainly does not require the presence of a physical display.” CPHBr. at 14. The Commission disagrees. In the context of the ’564 patent and claim 1 in particular, the Commission finds the plain and ordinary meaning of “playing back” the content requires visual display of the content. DISH emphasizes that claim 1 of the ’564 patent “specifically ties ‘playing back’ to the ‘requested media files,’ which it recites is being played back ‘with the media player,’ rather than a display.” *Id.* at 15. That the media player is the software performing the playback does not foreclose the fact that the claimed end user station also comprises a display.

DISH further argues that the specifications “contemplate a broader meaning that does not require visually displaying or playing video to a user.” *Id.* at 16. DISH points out that the specification of the ’564 patent “explains that the components of the media player ‘present’ received streamlets for use by ‘other components.’” *Id.* (citing JX-0001 (’564 patent) at 9:53–58 (“If the network controller module 406 has requested a streamlet 212 in multiple parts, with each part requested on mutually independent TCP/IP connections, the network controller module 406 reassembles the parts to *present* a complete streamlet 212 for use by all *other components* of the client module.”) (DISH’s emphases)). To DISH, “presenting” and “providing” therefore “include no more than making a video signal available to other components”; “[a]ctual display of the video signal is not required.” *Id.*

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DISH’s focus on the specification’s statement regarding “present[ing] a complete streamlet 212 for use by other components” (JX-0001 (’564 patent) at 9:53–58) is misplaced in the context of the ’564 patent. Unlike claim 16 of the ’554 patent and claim 10 of the ’555 patent, which are directed to “provid[ing]” “streamlets” “for playback,” claim 1 of the ’564 patent is directed to presenting the “video *by playing back* the requested media files.” Thus, even if the ’564 patent specification uses “present” in a way other than in the sense of “showing,” as with the ’156 patent, claim 1 of the ’564 patent is also distinguishable from claim 1 of the ’156 patent, which merely recites “presenting the video *for* playback” and does not require actual playback as does claim 1 of the ’564 patent.

Accordingly, the Commission finds that claims 1, 3, and 5 of the ’564 patent require a display.

4. Technical Prong

The Commission next applies the claim constructions discussed above to the domestic industry products to determine if DISH satisfied the technical prong of the domestic industry requirement as to the Asserted Patents. *See Alloc*, 342 F.3d at 1375; *Ethicon Endo-Surgery*, 149 F.3d at 1315; *O2 Micro*, 521 F.3d at 1362. Here, the parties chose to frame their dispute around whether the claims require a display. No party disputes that the domestic industry products practice the claims if no display is required, but do not practice the claims if a display is required. *See* RPHBr. at 94–97, 98; RPHBr. (Reply) at 28–39; RBr. at 14–21; OPHBr. at 149–57; OPHBr. (Reply) at 1–18; OBr. at 14–17; CBr. at 4–9. Accordingly, there is no factual dispute for the Commission to resolve here. Moreover, the record demonstrates DISH met its burden to show the domestic industry products practice the relevant claims of the ’554, ’555, and ’156 patents, which do not require a display. *See* CX-0010C (Negus DWS) Q747, 748; CDX-0010C.HS.4, 6, 11 (CX-1210 (element-sink); CX-0356CSC [REDACTED]; CX-

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[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]; CDX-0010C.TEST.164, 171; CX-0814C (Hopper 3 Live News Oct 21.pcapng); CDX-0010C.AS.4 (CX-0998 (exoplayer-amazon-port-amazon-r2.11.3); CDX-0010C.TEST.159, 161 (CX-0812C (Sling on Amazon Fire TV Live News Oct 21.chls); and CX-0813C (Sling on Amazon Fire TV Live Sports Oct 21.chls). The Commission has therefore determined that DISH has shown that the domestic industry products practice claims 16 and 17 of the '554 patent, claims 10, 11, and 14 of the '555 patent, and claims 1 and 4 of the '156 patent.

As for claims 1, 3, and 5 of the '564 patent, the Commission has determined that DISH has not satisfied the technical prong of the domestic industry requirement. As discussed above, these claims require a display, and it is undisputed that the domestic industry products do not have displays. *E.g.*, RBr. at 10; OPet. at 2. Accordingly, DISH failed to satisfy the domestic industry requirement as to the '564 patent, precluding a finding of a violation as to that patent.

B. Priority and Anticipation Over a Prior Public Use

Before the CALJ, Respondents argued that a prior public use by Move Networks, Inc. of its Move Media Player anticipated the asserted claims of the '554 and '555 patents. *See, e.g.*, Final ID at 217. Respondents argued that the Move Media Player used adaptive bitrate streaming technology to live stream a church event to a public audience over the Internet in October 2005, and that Move continued to use its adaptive bitrate streaming technology to livestream BYUtv channel content over the Internet until at least February 7, 2006. *See id.* (citing RPHBr. at 232). DISH did not dispute that the Move Media Player met the limitations of the asserted claims of the '554 and '555 patents, but instead argued that the priority date of the

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asserted claims of those patents predates the public use such that the public use is not prior art. CPHBr. (Reply) at 67–68. Respondents disputed DISH’s priority date claim. *See* RPHBr. at 217, 169–72.

The Final ID rejected Respondents’ argument, finding that the claims of the ’554 and ’555 patents are entitled to the priority date of the ’831 Provisional Application. *See* Final ID at 172. Because the public use in question was well after that priority date, the Final ID found that Respondents’ prior public use invalidity argument failed. *See id.* at 217.

Respondents petitioned for review of the Final ID’s finding that the asserted claims of the ’554 and ’555 patents (referred to herein as the “Live Event Claims”) are entitled to claim priority to the ’831 Provisional Application and the Final ID’s related finding that those claims are not invalid over the alleged prior public use of the Move Media Player. *See* RPet. at 63–69. Respondents argued that the Final ID erred by improperly placing the burden on Respondents to show that the Live Event Claims are not entitled to claim priority to the ’831 Provisional Application. *Id.* at 63–64. Respondents further argued that the record does not support a finding that the ’831 Provisional Application sufficiently describes and enables streaming live content, as required by the Live Event Claims. *Id.* at 64–68. Respondents thus argued that the Final ID erred in finding that the Live Event Claims are not invalid over the prior public use of the Move Media Player. *Id.* at 68–69.

The Commission determined to review this issue. 87 Fed. Reg. at 72511. On review, the Commission affirms the Final ID and replaces its analysis with the analysis below, which is substantively the same with alterations only to clarify that the Final ID properly applied the relevant burdens in its analysis.

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1. The Applicable Law

A party cannot be held liable for infringement if the asserted patent claim is invalid. *See Pandrol USA, LP v. AirBoss Ry. Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). For patents subject to the pre-America Invents Act (“AIA”) provision for invalidity for anticipation/lack of novelty, “[a] person shall be entitled to a patent unless . . . the invention was known or *used* by others in this country, *before the invention thereof* by the applicant for patent.” 35

U.S.C. §102(a) (pre-AIA) (emphases added). For patents subject to the AIA provision for invalidity for anticipation/lack of novelty, “[a] person shall be entitled to a patent unless . . . the claimed invention was patented, described in a printed publication, or *in public use*, on sale, or otherwise available to the public *before the effective filing date* of the claimed invention.” 35

U.S.C. § 102(a)(1) (AIA) (emphases added).³⁵

Regarding patent priority dates (relevant for determining whether prior art is before the subject inventions or effective filing dates), 35 U.S.C. § 120 declares:

An application for patent for an invention disclosed in the manner provided by section 112(a) . . . in an application previously filed in the United States . . . which names an inventor or joint inventor in the previously filed application shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.

35 U.S.C. § 120.

³⁵ The determination of the priority date dispute here determines whether the claims of the ’554 and ’555 patents are subject to the pre-AIA or AIA provision for lack of novelty, but the ultimate conclusion of anticipation is the same regardless of which version of the provision applies.

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The Federal Circuit has clarified the burdens of persuasion and production (or “going forward”) in the situation (presented here) where an accused infringer asserts that prior art anticipates the claims of an issued patent and the claims would not be anticipated if those claims are entitled to an invention date or effective filing date that is earlier than the prior art (*i.e.*, if the prior art is not truly “prior” art). *See Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–29 (Fed. Cir. 2008). In that case, the proponent of the invalidity defense (the accused infringer) always maintains the burden of persuasion of showing by clear and convincing evidence that the claims are anticipated by clear and convincing evidence. *See id.* at 1327. The burden of production (or going forward with evidence) is not constant, but rather shifts depending “on where in the process of trial the issue arises.” *Id.* The phrase “going forward with evidence” means “both producing additional evidence and presenting persuasive argument based on new evidence or evidence already of record, as the case may require.” *Id.* The proponent of the defense has the “burden of going forward with evidence that there is such anticipating prior art.” *Id.* Once that is done, the patentee “has the burden of going forward with evidence either that the prior art does not actually anticipate, or . . . that it is not prior art because the asserted claim is entitled to the benefit of a filing date prior to the alleged prior art.” *Id.* This requires the patentee to show “not only the existence of the earlier application, but why the written description in the earlier application supports the claim.” *Tech. Licensing*, 545 F.3d at 1327. Once, that is done, the burden of going forward again shifts to the proponent of the invalidity defense “to convince the court that [the patentee] is not entitled to the benefit of the earlier filing date.” *Id.* Here, “convince” means that, “if the court is not persuaded by clear and convincing evidence that [the proponent] is correct, [the proponent] has failed to carry its

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ultimate burden of persuasion, and its defense of invalidity, based on anticipation . . . fails.” *Id.* at 1328.

2. The Commission’s Determination

Respondents argue that claims 16, 17 and 20 of the ’554 patent and claims 14 and 15 of the ’555 patent cannot claim priority to the ’831 Provisional Application because the “live event” aspect of the invention in those claims is not sufficiently described and enabled in the ’831 Provisional Application. *See* RPHBr. at 108. DISH contends that the ’831 Application describes and enables the asserted claims. *See* CPHBr. at 167–70.

Respondents satisfied their initial burden of going forward by producing evidence regarding the public use of the Move Media Player prior to the filing date of the patent applications giving rise to the ’554 and ’555 patents and evidence that the use of the Move Media Player meets all limitations of the asserted claims of the ’554 and ’555 patents. *See* RPHBr. at 232–33 (citing, *inter alia*, JX-0062C (Major Tr.) at 120–23, 209–10, 223–25; RX-0394 (LDS Report); RX-0001C (Richardson DWS) at Q/A 374, 377; CX-0008C (Jeffay RWS) at Q/A 195–96)); *see also Tech. Licensing*, 545 F.3d at 1327.

However, DISH satisfied its burden of going forward by producing evidence and persuasive argument that the asserted claims of the ’554 and ’555 patents are entitled to the benefit of a filing date prior to the Move Media Player public use. *See, e.g., CPHBr.* at 168–70; *see also Tech. Licensing*, 545 F.3d at 1327. We note that, while Respondents concede that the ’831 Provisional Application refers to “live” video, they nevertheless argue that “there is no description of how live video transfer could be done using the system described in the specification such that a [person of ordinary skill in the art] would understand the inventors to actually possess the invention.” RPHBr. at 108.

The ’831 Provisional Application recites:

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[0007] In the depicted embodiment, the system 100 also includes a publisher 110, and a web server 116. The publisher 110 may be a creator or distributor of content. For example, if the content to be streamed were a broadcast of a television program, the publisher may be a television or cable network channel such as NBC®, or MTV®. Content may be transferred over the internet 106 to the content server 102, where the content is received by a content module 112. The content module 112 may be configured to receive, process, and store content. In one embodiment, processed content is accessed by a client module 114 configured to play the content on the end user station 104. In a further embodiment, the client module 114 is configured to receive different portions of a content stream from a plurality of locations simultaneously. For example, the client module 114 may request and receive content from any of the plurality of web servers 116.

[0008] Figure 2a is a schematic block diagram graphically illustrating one embodiment of a content file 200. In one embodiment, the content file 200 is distributed by the publisher 110. *The content file 200 may comprise a television broadcast, sports event, movie, music, concert, etc. The content file 200 may also be live or archived content.* The content file 200 may comprise uncompressed video and audio, or alternatively, video or audio. Additionally, the content file 200 may be compressed. Examples of a compressed content file 200 include, but are not limited to, DivX®, Windows Media Video 9®, Quicktime 6.5 Sorenson 3®, or Quicktime 6.5/MPEG-4® encoded content.

JX-0029 ('831 Provisional Application), ¶¶ [0007–08] (emphasis added). As shown in the above-recited paragraphs, the '831 Provisional Application expressly discloses that the “content file 200” may be a “live” event. The '831 Provisional Application further describes methods of streaming content in more detail:

[0026] Figure 5 is a schematic flow chart diagram illustrating one embodiment of a method 500 for processing content in accordance with the present invention. In one embodiment the method 500 starts 502, and the content module 112 receives 504 content from the publisher 110. Receiving content 504 may comprise receiving 504 a digital copy of the content file 200, or digitizing a physical copy of the content file 200. *Alternatively, receiving 504 content may comprise capturing a radio or television broadcast.* Once received 504, the stream module 302 generates 506 a plurality of streams 202, each stream 202 having a different quality. The quality may be predefined, or automatically set according to end user bandwidth, or in response to pre-designated publisher guidelines.

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[0027] The streamlet module 304 receives the streams 202 and generates 508 a plurality of streamlets 212. In one embodiment, *generating 508 streamlets comprises dividing the stream 202 into a plurality of two second streamlets 212*. Alternatively, the streamlets may have any length less than or equal to the length of the stream 202. *The encoder module 306 then encodes 510 the streamlets according to a compression algorithm*. In a further embodiment, the algorithm comprises a proprietary codec such as WMV9®. The encoder module 306 then stores 512 the encoded streamlets in the streamlet database 308. Once stored 512, the web server 116 may then serve 514 the streamlets. In one embodiment, serving 514 the streamlets comprises receiving streamlet requests from the client module 114, retrieving the requested streamlet from the streamlet database 308, and subsequently transmitting the streamlet to the client module 114. The method 500 then ends 516.

Id. at ¶¶ [0026–27] (emphases added). As indicated, the ’831 Provisional Application teaches that live video content may be created and encoded by dividing a content stream into streamlets, for example streamlets of two seconds in length, and then encoding the streamlets at multiple bitrates. *See id.* at ¶ [0027]. A person of skill in the art would understand from these teachings how to make a video stream of a live event available to a viewer before the live event is complete. *See CX-0008C (Jeffay RWS) at Q/A 36*. Based on the above, DISH satisfied its burden of going forward. *See Tech. Licensing*, 545 F.3d at 1327

Since DISH satisfied its burden of going forward, the burden of going forward shifts to Respondents “to convince the [Commission] that [DISH] is not entitled to the benefit of the earlier filing date.” *See id.* Again, here, “convince” means that, “if the [Commission] is not persuaded by clear and convincing evidence that [Respondents are] correct, [Respondents have] failed to carry [their] ultimate burden of persuasion, and [their] defense of invalidity, based on anticipation . . . fails.” *Id.* at 1328.

Respondents argue that “all the disclosure of how ‘live’ video could be handled was added in a continuation-in-part application [U.S. Pat. Application No. 11/673,483], filed February 9, 2007.” RPHBr. at 109 (citing RX-0001C (Richardson DWS) at Q/A 77). However,

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as explained above, the '831 Provisional Application teaches the creation and encoding of two-second streamlets that enable and describe the claimed subject matter. As Dr. Jeffay testified, the additional disclosure in CIP Specification relates to specific improvements that use two-pass or multi-pass encoding with parallel encoders. *See* CX-0008C (Jeffay RWS) at Q/A 35.

Respondents have thus failed to show by clear and convincing evidence that the asserted Live Event Claims are not entitled to the priority date of the '831 Provisional Application, and thus Respondents have also failed to show by clear and convincing evidence that the Live Event Claims are anticipated by the Move Media Player's public use.

C. Whether the Asserted Claims of the '555 Patent Are Invalid for Misjoinder of Mr. Brueck

Respondents argued to the CALJ that the claims of the '555 patent are invalid for misjoinder of Mr. Brueck. *E.g.*, RPHBr. at 247. The Final ID rejected that argument. *See* Final ID at 217–18. The '554 and '555 patents are part of a line of continuations from the '483 CIP Application filed in 2007 that added new material to the specification as compared to the '831 Provisional Application and the '783 Application, filed in 2004 and 2005, respectively. *See supra*, at Part II.C.; *see, e.g.*, CDX-0008C at 8; RPHBr. at 247. The '554 and '555 patents both name Drew Major, Mark Hurst, and Dave Brueck as inventors. JX-0002 ('554 patent) at cover page; JX-0003 ('555 patent) at cover page. Mr. Brueck was not named as an inventor on the '831 Provisional Application or the '783 Application. *E.g.*, JX-0002 ('554 patent) at cover page; JX-0003 ('555 patent) at cover page; JX-0065C (Brueck Tr.) at 79:25–80:16.

Respondents thus argued that, for Mr. Brueck to be properly named as an inventor on the '554 and '555 patents, he must have contributed to conception of something that was added to the '483 CIP Application in 2007 and then claimed in the '554 and '555 patents. *E.g.*, RPHBr. at 247.

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The Final ID rejected Respondents’ contention that named inventor Mark Hurst alone conceived of the virtual timeline concept claimed in the ’554 patent and Respondents’ related contention that the ’554 and ’555 patents are invalid for misjoinder of Mr. Brueck. *See* Final ID at 217–18 (citing RPHBr. at 247–50). The Final ID found that “Mr. Brueck and Mr. Hurst jointly conceived the virtual timeline aspect of the invention and worked together to reduce it to practice.” *Id.* at 218 (citing JX-0065C (Brueck Dep.) at 99:2–6).

Respondents petitioned the Commission to review this issue, arguing that the Final ID failed to make a determination as to whether Mr. Brueck is misjoined on the ’555 patent. *See* RPet. at 69–74. Respondents reason that no party disputes that the ’555 patent does not include claims directed to virtual timelines. *See id.* at 70–71.

The Commission determined to review the Final ID’s finding that the asserted claims of the ’555 patent are not invalid for misjoinder of Mr. Brueck. *See* 87 Fed. Reg. at 72511. On review, the Commission agrees with Respondents that the ’555 patent does not claim virtual timelines. Nonetheless, the Commission affirms the Final ID on the alternative basis discussed below.

1. The Applicable Law

“A patent is invalid if more or less than the true inventors are named.” *Trovan, Ltd. v. Sokymat SA, Irori*, 299 F.3d 1292, 1301 (Fed. Cir. 2002). Section 116 of the Patent Act provides the standard for joint inventorship:

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.

35 U.S.C. § 116.

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“Because conception is the touchstone of inventorship, each joint inventor must generally contribute to the conception of the invention.” *Ethicon, Inc. v. U.S. Surgical Corp.*, 135 F.3d 1456, 1460 (Fed. Cir. 1998). Conception exists “when a definite and permanent idea of an operative invention, including every feature of the subject matter sought to be patented, is known.” *Sewall v. Walters*, 21 F.3d 411, 415 (Fed. Cir. 1994). In other words, conception is only complete when the “idea is so clearly defined in the inventor’s mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation.” *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1228 (Fed. Cir. 1994). Inventorship is a question of law based on underlying factual determinations. *Vapor Point LLC v. Moorhead*, 832 F.3d 1343, 1348 (Fed. Cir. 2016).

2. The Commission’s Determination

Respondents did not meet their burden of showing misjoinder by clear and convincing evidence. Respondents argue that Mr. Brueck, while named as an inventor on the ’555 patent, did not contribute to any subject matter claimed therein. However, the Commission finds that Mr. Brueck contributed to the multi-pass encoding invention claimed in dependent claims 9, 16, and 25 of the ’555 patent.

First, claims 9, 16, and 25 of the ’555 patent cover multi-pass encoding. The ’555 patent describes “multi-pass encoding” as improving streaming for live events. *See, e.g.*, JX-0003 (’555 patent) at 10:65–11:25 (“A system as described above . . . enables multi-pass encoding of live events.”). Dr. Jeffay declared that the ’555 patent includes an improved way of streaming live events using multi-pass or “two-pass” encoding that resulted in a reduced latency delay of as little as *ten seconds*. CX-0008C (Jeffay RWS) at Q35, 196. At least dependent claims 9, 16, and 25 of the ’555 patent expressly claim this improved ten-second delay multi-pass concept. JX-0003 (’555 patent) at claim 9 (“10 second delay”), claim 16 (same), claim 25 (same). Dr.

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Jeffay confirmed that, for the ten-second delay limitations, “the encoding is being done using what the patent calls ‘parallel encoding,’” (*i.e.*, multi-pass encoding). Tr. (Jeffay) at 620:17–25; CX-0008C (Jeffay RWS) at Q35.

The Commission finds that Mr. Brueck contributed to the claimed multi-path encoding. Mr. Major, a named co-inventor on the ’555 patent, testified that Mr. Brueck “was involved in building certainly the architecture of where you had multiple streams—or multiple servers doing concurrent” encoding of live events. *See, e.g.*, CX-0001C (Major DWS) at Q/A 13, 14, 20, 53; JX-0062C (Major Dep.) at 199:6–200:2; JX-0003 (’555 patent) at Figs. 5a, 5b. Moreover, all three inventors on the ’555 patent, including Mr. Brueck, testified that the inventors listed on the Asserted Patents are correct. CX-0001C (Major DWS) at Q/A 10, 20; JX-0062C (Major Dep.) at 123:2–5, 198:17–201:17; JX-0084C (Hurst Dep.) at 41:6–18, 46:3–14; JX-0065C (Brueck Dep.) at 80:17–81:8, 75:13–77:16, 99:2–14; CX-0008C (Jeffay RWS) at Q/A 35, 196, Tr. (Jeffay) at 620:17–25. For example, Mr. Brueck declared: “I had some ideas on how to make that work efficiently and make sure . . . during a live stream, making sure we’re keeping up with encoding.” JX-0065C (Brueck Dep.) at 80:17–81:5. Mr. Major corroborated Mr. Brueck’s contribution to the multi-pass encoding claims of the ’555 patent. *E.g.*, JX-0062C (Major Dep.) at 199:6–200:2.

Respondents argue that DISH’s contention that the ’555 patent claims multi-pass encoding is inconsistent with its position earlier in the investigation that the ’831 Provisional Application provides support for the “ten-second delay” claim language of claim 16. *See* RBr. at 26–27 (citing JX-0065C (Brueck Tr.) at 79:25–80:16; RX-0152C (DISH 6/15/21 Rog Resp) at 124, 128). Respondents reason that, because DISH alleged that this claim language has support in the ’831 Provisional Application and because Mr. Brueck was not named as an

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inventor on the '831 Provisional Application, then inventions related to the “ten-second delay” cannot be attributed to Mr. Brueck, and Mr. Brueck is therefore misjoined on the '555 patent. *See id.* The Commission is not persuaded. First, the '831 Provisional Application does not include any mention of a ten-second delay. Therefore, DISH's original contention was mistaken. Second, DISH appears to have recognized that it was mistaken. After discovery and depositions, DISH withdrew claim 16 from the investigation. *See* Order No. 21 (Mar. 3, 2021), *unreviewed by* Comm'n Notice (Mar. 23, 2021). Withdrawal is reasonable (and expected) if the claims do not have priority to the '831 Provisional Application because, without the benefit of that priority date, claim 16 could be challenged as invalid based on the prior public use of the Move Media Player asserted in this investigation. *See, e.g.*, Final ID at 217.

Respondents additionally argue that the fact that a patent in the same family as the '555 patent that issued before the '555 patent expressly claims multi-pass encoding without using the phrase “ten-second delay” shows that the claims of the '555 patent do not cover multi-pass encoding through the use of the “ten-second delay” language. *See* RBr. at 27. Again, the Commission is not persuaded. We see no relevance to the timing of the issuance of the two patents. Also, the Commission does not agree with Respondents' unstated assumption that DISH cannot claim its multi-pass encoding invention in different ways in different patents in the same patent family. There are benefits to a patentee that come from claiming certain aspects of an invention in different ways (such as different levels of breadth) in different claims.

Respondents further argue that DISH did not properly preserve its “multi-pass encoding” argument because DISH failed to present the argument in its pre-hearing brief, and therefore DISH was barred from presenting the argument in its post-hearing brief. *See, e.g.*, RBr. at 21–23. The Commission disagrees. This argument is properly part of the investigation at least

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because OUII undisputedly presented this argument in its pre-hearing brief. *See* OPHBr. at 217–18.

Accordingly, for the reasons stated herein, the Commission finds that Respondents failed to meet their burden of showing misjoinder by clear and convincing evidence.

V. REMEDY, BONDING, AND THE PUBLIC INTEREST

In view of the above, the Commission finds a violation of section 337 by Respondents as to claims 1, 2, and 4 of the '156 patent, claims 16, 17, and 20 of the '554 patent, and claims 10, 11, 14, and 15 of the '555 patent. We now turn to the scope of the remedy addressing that violation.

A. Remedy

The Commission has “broad discretion in selecting the form, scope, and extent of the remedy.” *Viscofan, S.A. v. US. Int’l Trade Comm’n*, 787 F.2d 544, 548 (Fed. Cir. 1986).

1. Limited Exclusion Order

Section 337(d)(1) provides that “[i]f the Commission determines, as a result of an investigation under this section, that there is a violation of this section, it shall direct that the articles concerned, imported by any person violating the provision of this section, be excluded from entry into the United States, unless, after considering the [public interest], it finds that such articles should not be excluded from entry.” 19 U.S.C. § 1337(d)(1).

a. The RD

The RD recommended that the Commission issue an LEO against Respondents. *See* RD at 257–58. The RD further recommended that any LEO include a standard certification provision. *Id.* at 257 (citing *Certain Chemical Mechanical Planarization Slurries & Components Thereof*, Inv. No. 337-TA-1204, Comm’n Op. at 26 (Jan. 6, 2022)). The RD additionally recommended denying Respondents’ request for an enforcement delay of the

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remedy to allow Respondents time to implement non-infringing redesigns. *See id.* at 258. The RD reasoned that neither of the proffered redesigns would be non-infringing alternatives. *See id.* The RD also recommended denial of Respondents’ request for an exemption for service and repair of any products already sold to customers under warranty “because respondents have failed to provide evidence that the public interest supports this request and because respondents did not produce any evidence to identify which spare parts are of particular importance or should be permitted entry.” RD at 259–60 (citing *Certain Unmanned Aerial Vehicles & Components Thereof*, Inv. No. 337-TA-1133, Comm’n Op. at 27 (Sept. 8, 2020)).

b. The Parties’ Arguments

i. DISH’s Arguments

DISH supports the RD’s recommendation of issuing an LEO and denying Respondents’ request for an enforcement delay. *See* CBr. at 24–25. DISH asserts that the “delay sought by Respondents is for their *own* interests, not *public* interests.” CBr. (Reply) at 13 (DISH’s emphasis); *see also id.* at 13–14. DISH further opposes the carve-outs to the remedial orders requested by Respondents (discussed below). *See id.* at 16–17. DISH additionally opposes the repair and replacement exceptions requested by Respondents (also discussed below). *See id.* at 17.

ii. Respondents’ Arguments

Respondents argue that “[i]ssuing a remedy impacting Respondents’ Accused Products based on their as-intended use of ExoPlayer, HLS, and/or MPEG-DASH [(standard technologies)] would effectively impact numerous participants in the video streaming industry.” RBr. at 31; *see also id.* at 29–33. Respondents reason that DISH’s requested remedy, which addresses products “based on third-party standards and protocols” would have an “anti-competitive impact on consumers, requiring a narrowly tailored remedy that lessens the anti-

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competitive impact on U.S. consumers.” *Id.* at 32–33.³⁶ Respondents further assert that “DISH chose to leverage the threat of an ITC remedy against Respondents who do not compete with DISH and simply employ the products and protocols as designed by third-parties who are not part of this Investigation.” *Id.* at 32.

Respondents next argue that any LEO should include a “120-day delay to implement non-infringing functionality” via software modifications. RBr. at 33; *see also id.* at 33–36 (citing, *inter alia*, *Certain Personal Data & Mobile Communications Devices & Related Software*, Inv. No. 337-TA-710, Comm’n Final Determination (Dec. 19, 2011) (“*Personal Data Devices*”)). Respondents allege that the Final ID’s infringement findings are software-based, rather than hardware-based, and therefore software modifications can allegedly render the Accused Products non-infringing. *Id.* at 33. According to Respondents, “[a]llowing the requested 120-day delay period is necessary and appropriate to allow Respondents time to make such software updates, test and debug, and update documentation while protecting the interests of U.S. consumers in having access to Respondents’ unique and innovative connected fitness products.” *Id.* at 34 (citing, *inter alia*, *Personal Data Devices*, Comm’n Final Determination; *Certain Lithium Ion Batteries, Battery Cells, Battery Modules, Battery Packs, Components Thereof, & Processes Therefor*, Inv. No. 337-TA-1159, Comm’n Op. (Mar. 4, 2021)). Respondents assert that those software updates can take up to “five months or longer to implement.” *Id.* at 34–36.

Respondents then argue that any LEO should include a standard certification provision. RBr. at 36–37.

³⁶ The Commission addresses this argument in its discussion of the public interest factors, *infra*.

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Respondents additionally argue that any LEO should expressly exclude hardware components unrelated to streaming, including those not integrated with a display on which video is streamed. *Id.* at 37. Respondents point out that DISH “expressly acknowledge[d] in its Public Interest Statement that ‘fitness devices that do not include any streaming components’ or ‘fitness devices that stream content without infringing the asserted patents’ are alternatives to the allegedly infringing functionality of Respondents’ Accused Products.” *Id.* (quoting DStmt. at 3–4).

Respondents further argue that any LEO should be limited to products found to infringe specific patent claims. RBr. at 37–38. Respondents assert that “Peloton’s [REDACTED] was not accused of infringement of the ’564 or ’554 patents and was found not to infringe claim 4 of the ’156 patent.” *Id.* at 37 (citing Final ID at 80 n.14).

Respondents additionally argue that any remedial order should include exceptions that allow Respondents to “continue to update, service, repair or replace any products already sold to consumers before the effective date of any remedial order, and to complete any pending contracts or purchase orders.” RBr. at 39 (citing *Certain Sys. for Detecting & Removing Viruses or Worms*, Inv. No. 337-TA-510, Comm’n Op. at 6 (Aug. 23, 2005)).

iii. OUII’s Arguments

OUII supports the RD’s recommendation of an LEO with a certification provision. *See* OBr. at 21–22. OUII opposes Respondents’ request for a 120-day delay for the effectiveness of any remedial orders, reasoning that both DISH and Respondents identified third party like or directly competitive products to the Accused Products. *See* OBr. (Reply) at 12–13.

OUII then addresses Respondents’ request for carveouts from the scope of the remedial orders. *See id.* at 13–14. Regarding Respondents’ request for an express exclusion for hardware components not integrated with the display on which video is streamed, OUII states

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that an express exemption is unnecessary because such hardware components would not be subject to the remedial orders. *See id.*

OUII also addresses Respondents' request to narrowly tailor the remedial orders to identify the specific products found to infringe and which claims they were found to infringe. *Id.* at 14. OUII responds that the remedial orders should not be limited to products that were actually adjudicated to infringe the Asserted Patents. OBr. (Reply) at 14 (citing *Certain Audio Players & Controllers, Components Thereof, & Prods. Containing the Same*, Inv. No. 337-TA-1191, Comm'n Op. at 24 (Feb. 1, 2022)). However, OUII declares that the orders "should have a carve out for certain of Respondents' Accused Product implementations that were found to be non-infringing of certain claims—specifically Peloton products using the [REDACTED]." *Id.* (citing Final ID at 128 n.19).

OUII further addresses Respondents' request for an exemption to the remedial orders to continue to update, service, repair, or replace products already sold to customers in the U.S. and to import parts and components necessary for repair or replacement. *See id.* at 15–16. OUII supports the request, reasoning that "U.S. consumers would be harmed if Respondents could not fulfill their warranty obligations, which would potentially render existing owner's [sic] products inoperable." *Id.* at 16.

OUII additionally points out that DISH's proposed remedial orders include a definition of "covered articles" that is different than and inconsistent with the plain language of the accused products in the Commission's notice of investigation. *See* OBr. (Reply) at 10–11. OUII also notes that DISH did not explain why its remedial orders deviate from the notice of investigation. *See id.* at 11. Therefore, according to OUII, the Commission should use the definition provided in the notice of investigation. *See id.*

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c. The Commission's Determination

The Commission has determined to issue an LEO with a standard certification provision. The Commission includes this certification provision to aid Customs and Border Protection (“CBP”) in enforcing Commission orders. CBP is not mandated to “accept certification[s] as proof that the articles in question are not covered by the [LEO].” *See, e.g., Certain Robotic Vacuum Cleaning Devices & Components Thereof Such as Spare Parts*, Inv. No. 337-TA-1057, Comm’n Op., at 55 (Feb. 1, 2019) (internal quotation marks omitted). The certification provision allows persons to certify that, to the best of their knowledge and belief, the products being imported are not excluded from entry. This standard provision can only be used for products that have been explicitly adjudicated as non-infringing. *Certain Composite Aerogel Insulation Materials & Methods for Manufacturing the Same*, Inv. No. 337-TA-1003, Comm’n Op. at 62 (Feb. 22, 2018) (“*Composite Aerogel Insulation Materials*”) (declaring that CBP “only accepts a certification that the goods have been previously determined by CBP or the Commission not to violate the exclusion order”). Respondents cannot certify as to products that have not been adjudicated to be non-infringing.

The Commission denies Respondents’ request that the LEO be narrowly tailored to identify the specific products found to infringe and which patent claims they were found to infringe. RBr. at 37. Tailoring remedies to the specific products found to infringe is inconsistent with Commission practice. *See, e.g., Certain Graphics Sys., Components Thereof, & Consumer Prods. Containing Same*, Inv. No. 337-TA-1044, Comm’n Op. at 66 (Sept. 18, 2018) (“*Graphics Sys.*”); *Certain Audio Players & Controllers, Components Thereof, & Prods. Containing the Same*, Inv. No. 337-TA-1191, Comm’n Op. at 24 (Feb. 1, 2022). Under the Commission’s standard practice, LEOs are not limited to any particular product models, but instead cover products of the named respondents that infringe the asserted claims. *Graphics*

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Sys., Comm’n Op. at 66. And, while the Commission has exempted products that were adjudicated in an investigation and found to be non-infringing (*see Certain Audio Players & Controllers, Components Thereof, & Prods. Containing the Same*, Inv. No. 337-TA-1191, Comm’n Op. at 23–24 (Feb. 1, 2022)), and thus products as to which a respondent may take advantage of the standard certification provision, no product here fits both criteria. Respondents seek an exemption for Peloton’s [REDACTED]. However, DISH did not accuse those products of infringing the ’554 patent, and thus those products were not actually adjudicated as non-infringing as to that patent. Final ID at 80 n.14, & 135 n.20. In addition, those products were found to infringe claim 1 of the ’156 patent and claims 10 and 11 of the ’555 patent. *E.g., id.* at 114–15, 126, 153, 157, & 254.

Respondents also request that any LEO explicitly exempt or exclude hardware components that are “not integrated within the display on which video is streamed.” RBr. at 37. The Commission denies Respondents’ request. Respondents have not identified or explained what hardware components are of concern nor have they pointed to any evidence that such components are non-infringing. In effect, Respondents ask the Commission to pre-approve components as non-infringing that have not been produced by Respondents in this investigation. The Commission declines to provide an exemption for these products inasmuch as they have not been explicitly adjudicated as non-infringing. Covered articles, per the plain English statement in the Complaint (and the notice of investigation and the Commission’s remedial orders), are “fitness devices containing Internet-streaming enabled video displays that are capable of using adaptive bit-rate streaming to stream content, Internet-streaming enabled video displays that are capable of using adaptive bit-rate streaming to stream content and that are designed to be incorporated with fitness devices, and *components thereof*.” Compl. at 12 (emphasis added).

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However, as discussed in more detail in the public interest section below, the Commission grants Respondents' request for an exemption to the remedial orders to allow Respondents to import components, parts, or products needed to repair or replace products already sold to customers in the United States.

Respondents further seek an exemption for software updates to products already in the United States. *E.g.*, RBr. at 3. Such an exemption is unnecessary because the Commission's remedial orders do not cover electronic transmissions or software already in the United States, and Respondents have stated that the preferred method of updating software would be through internet or Wi-Fi, and not software stored on physical media. *See, e.g., ClearCorrect Operating, LLC v. Int'l Trade Comm'n*, 810 F.3d 1283, 1293–94 (Fed. Cir. 2015); RBr. at 39.

The Commission has also determined to deny Respondents' request for a 120-day delay of the enforcement of the remedial orders to allow Respondents to implement non-infringing functionality through software changes. As Respondents note, the Commission has historically provided a delay to the enforcement of its remedial order when necessary to mitigate a significant public interest concern. *See* RBr. at 34. However, as discussed below, the only significant public interest concern the Commission finds is that of U.S. consumers obtaining service and repair of their existing fitness devices, and that concern will be mitigated by the Commission's determination to include an exemption to the remedial orders (also discussed below).

Regarding Respondents' argument that the issued LEO will affect numerous non-respondents in the video streaming industry, RBr. at 31; *see also id.* at 29–33, the Commission is issuing an LEO in this investigation which, unlike a general exclusion order, will apply only to infringing devices of the Remaining Respondents and are not directed to equipment from

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non-respondents. *See Kyocera Wireless Corp. v. Int’l Trade Comm’n*, 545 F.3d 1340, 1358 (Fed. Cir. 2008) (holding that section 337 only “permits LEOs to exclude only the violating products of named respondents”). And, regarding Respondents’ argument that “DISH chose to leverage the threat of an ITC remedy against Respondents who do not compete with DISH and simply employ the products and protocols as designed by third-parties who are not part of this Investigation,” RBr. at 32, the Commission notes that the section 337 remedies here are directed to Respondents’ products that infringe DISH’s patent rights. Third parties have expressed no such concerns given that no third parties have sought to intervene in this investigation nor have any third parties submitted public interest comments in response to the request for such submissions.

Lastly, the issued remedial orders include the definition of “covered articles” that is in the Commission’s notice of investigation. DISH’s proposed remedial orders include a definition of “covered articles” that is different than the plain language of the accused products in the Commission’s notice of investigation. DISH did not provide a persuasive reason for the change; therefore the Commission has determined to use the definition provided in the notice of investigation.

2. Cease and Desist Order

Section 337(f)(1) provides that in addition to, or instead of, the issuance of an exclusion order, the Commission may issue a CDO as a remedy for violation of section 337. *See* 19 U.S.C. § 1337(f)(1). CDOs are generally issued when, with respect to the imported infringing products, respondents maintain commercially significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion

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order.³⁷ See, e.g., *Certain Table Saws Incorporating Active Injury Mitigation Tech. & Components Thereof*, Inv. No. 337-TA-965, Comm’n Op. at 4–6 (Feb. 1, 2017); *Certain Protective Cases & Components Thereof*, Inv. No. 337-TA-780, USITC Pub. No. 4405, Comm’n Op. at 28 (Nov. 19, 2012) (citing *Certain Laser Bar Code Scanners & Scan Engines, Components Thereof & Prods. Containing Same*, Inv. No. 337-TA-551, Comm’n Op. at 22 (June 24, 2007)). For CDOs under section 337(f)(1), Complainants bear the burden of proof on this issue. “A complainant seeking a CDO must demonstrate, based on the record, that this remedy is necessary to address the violation found in the investigation so as to not undercut the relief provided by the exclusion order.” *Table Saws*, Comm’n Op. at 5 (citing *Certain Integrated Repeaters, Switches, Transceivers, & Prods. Containing Same*, Inv. No. 337-TA-435, USITC Pub. No. 3547 (Oct. 2002), Comm’n Op. at 27 (Aug. 16, 2002); see also H.R. REP. No. 100-40, at 160 (1987)).

a. The RD

The RD recommended that, if the Commission finds a violation of section 337, the Commission issue CDOs to the Respondents. RD at 259–60. The RD reasoned that DISH “adduced sufficient evidence showing that each respondent maintains commercially significant amounts of infringing products in the United States.” *Id.* at 259. As noted above, the RD further recommended denying Respondents’ request for a service and repair exemption because

³⁷ When the presence of infringing domestic inventory or domestic operations is asserted as the basis for a CDO under section 337(f)(1), Commissioner Schmidlein does not adopt the view that the inventory or domestic operations needs to be “commercially significant” in order to issue the CDO. See, e.g., *Certain Magnetic Tape Cartridges & Components Thereof*, Inv. No. 337-TA-1058, Comm’n Op. at 65 n.24 (Apr. 9, 2019); *Table Saws*, Comm’n Op. at 6 n.2 (Feb. 1, 2017). In Commissioner Schmidlein’s view, the presence of some infringing domestic inventory or domestic operations, regardless of its commercial significance, provides a basis to issue a CDO.

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Respondents “failed to provide evidence” supporting the request and because Respondents “did not produce any evidence to identify which spare parts are of particular importance or should be permitted entry.” *Id.* at 259–60 (citing *Certain Unmanned Aerial Vehicles & Components Thereof*, Inv. No. 337-TA-1133, Comm’n Op. (Sept. 8, 2020)).

b. The Parties’ Arguments

i. DISH’s Arguments

DISH argues that the Commission should issue CDOs because Respondents maintain a commercially significant inventory of the infringing products in the United States. *See* CBr. at 25 (citing *Certain Electric Skin Care Devices, Brushes & Chargers Therefore, & Kits Containing the Same*, Inv. No. 337-TA-959, Comm’n Op. at 26 (Feb. 13, 2017)). DISH states that the “evidence of record here establishes that each Respondent has approximately [REDACTED] [REDACTED].” *Id.* DISH provides the data below:

Respondent	Volume (Units)	Time (Months)
iFIT Respondents	[REDACTED]	[REDACTED]
Peloton	[REDACTED]	[REDACTED]

Id. (citing CX-0007C (Vander Veen DWS) at Q/A 95–97). DISH reasons that “CDOs are therefore needed to prevent Respondents from undercutting the remedial effect of the requested LEO with these commercially significant inventories.” *Id.*

ii. Respondents’ Arguments

Respondents argue that any CDO should be “narrowly tailored given that DISH and Respondents are not competitors, and any infringement by Respondents is predicated on Respondents’ use of off-the-shelf third-party software and protocols.” RBr. at 38. Respondents further contend that any CDO should be tailored consistent with its arguments regarding LEOs

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above, and that they should be permitted to update current inventory with non-infringing software. *Id.*

iii. OUII's Arguments

OUII agrees with DISH that the Commission should issue CDOs directed to each Respondent, based on the inventory and sale data discussed in the RD. *See* OBr. at 23.

c. The Commission's Determination

The Commission has determined to issue a CDO directed to each of the Remaining Respondents based on Respondents' inventory data.³⁸ Respondents do not dispute that they each have commercially significant domestic inventories. For the reasons discussed above in our analysis of the requested LEO, the Commission has also determined to (1) deny Respondents' request for a 120-day delay of the CDOs; (2) include in the CDOs a provision that indicates that the Remaining Respondents may import articles for use in service, repair, or replacement of devices sold to U.S. consumers as of the date of the CDO (discussed in more detail below); (3) deny Respondents' request that the CDOs be narrowly tailored to identify the specific products found to infringe and the claims they were found to infringe; and (4) use the definition of "covered articles" found in the notice of investigation. Again, Respondents' request for an exemption for software updates to products already in the United States is unnecessary because the Commission's remedial orders do not cover electronic transmissions or software already in the United States, and Respondents have stated that the preferred method of updating software would be through internet or Wi-Fi, and not software stored on physical

³⁸ Commissioner Schmidlein agrees that a CDO should issue directed to each of the remaining Respondents, but she differs from the majority with respect to the basis for that determination. *See supra* note 37 ("... the presence of some infringing domestic inventory or domestic operations, regardless of its commercial significance, provides a basis to issue a CDO.").

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media. *See ClearCorrect*, 810 F.3d at 1293–94; RBr. at 3. Also, regarding Respondents’ argument that a CDO will affect numerous non-respondents in the video streaming industry, RBr. at 31; *see also id.* at 29–33, the Commission again notes that the CDOs are directed to Respondents’ activities in the United States with respect to their infringing products.

B. Public Interest³⁹

Section 337 requires the Commission, upon finding a violation of section 337, to issue an LEO “unless, after considering the effect of such exclusion upon the public health and welfare, competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, and United States consumers, it finds that such articles should not be excluded from entry.” 19 U.S.C. §§ 1337(d)(l) & (g)(1). Similarly, the Commission must consider these public interest factors before issuing a CDO. 19 U.S.C. §§ 1337(f)(1), (g)(1).

Under appropriate facts and circumstances, the Commission may determine that no remedy should issue because of the adverse impacts on the public interest. *See, e.g., Certain Fluidized Supporting Apparatus & Components Thereof*, Inv. Nos. 337-TA-182/188, USITC Pub. 1667, Comm’n Op. at 1–2, 23–25 (Oct. 1984) (finding that the public interest warranted denying the complainant’s requested relief). Moreover, when the circumstances of a particular investigation require, the Commission has tailored its relief in light of the statutory public interest factors. *E.g., Certain Microfluidic Devices*, Inv. No. 337-TA-1068, Comm’n Op. at 1, 22–48, 53–54 (Jan. 10, 2020).

³⁹ The Commission did not instruct the ALJ to make findings on the public interest. *See* 86 Fed. Reg. at 6916.

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The statute requires the Commission to consider and make findings on the public interest in every case in which a violation is found regardless of the quality or quantity of public interest information supplied by the parties. 19 U.S.C. §§ 1337(d)(1), (f)(1), and (g)(1). Thus, the Commission publishes a notice inviting the parties as well as interested members of the public and interested government agencies to gather and present evidence on the public interest at multiple junctures in the proceeding. *See* 19 U.S.C. §§ 1337(d)(1), (f)(1), and (g)(1). The Commission's solicitation of public interest comments following the ALJ's RD did not result in submissions from third parties. The Commission did not receive any comments from the public in response to the Commission's notice of review of the Final ID, which also invited public interest comments from interested government agencies and interested persons.

The parties filed submissions on the public interest pursuant to Rule 210.50(a)(4)(i), 19 C.F.R. § 210.50(a)(4)(i), on October 11, 2022.

1. The Public Health and Welfare

Respondents contend that the remedial orders would deprive U.S. consumers of the health benefits from using their fitness devices and interfere with efforts to promote public health through exercise. *See* iStmt. at 2–3; PStmt. at 2–4.

DISH, on the other hand, argues that exclusion of the products at issue would not deprive the public of products necessary for some important health or welfare need of the type for which the Commission has previously denied issuing remedial orders. *See* DStmt. at 1–2. DISH declares that non-accused exercise equipment can provide the same health and welfare benefits as the accused products. *See* CBr. at 37–38. For example, DISH points to the following exercise programming available to United States consumers relating to public health through exercise:

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Activity	DISH ⁴⁰	Peloton ⁴¹	iFIT	MIRROR
Yoga	Everyday Yoga	Flow and Let Go	Transformative Yoga ⁴²	Yoga Flow ⁴³
Strength	Muscle Over Matter	Total Strength	Strength Training for Beginners ⁴⁴	Strength Total Body
Cardio/Aerobic	Dance Jam Pop and Hip-Hop Cardio Dance	Dance Cardio	Bodyweight Cardio Series ⁴⁵	Dance Cardio ⁴⁶
Meditation	Meditation Basics	Cultivate Inner Calm	iFIT Mind™ Panama Meditation Series ⁴⁷	Meditation ⁴⁸
HIIT/Bootcamp	HIIT Afterburn	Bootcamp Explorer	Dynamic High Intensity Series ⁴⁹	Bootcamp ⁵⁰

Id. at 27–28. DISH additionally points to exercise equipment provided by non-respondents that users can use to stream exercise programming onto their own tablets or smartphones. *Id.* at 31–34. This equipment includes a holder for a tablet or smart phone, but does not come equipped with an integrated streaming display. *See id.* Representative examples include the Lanos Exercise Bike and the Sole Fitness F80 Treadmill. *See id.* at 31.

⁴⁰ <https://my.dish.com/subscription-on-demand/grokker>;
<https://www.sling.com/channels/grokker>.

⁴¹ <https://www.onepeloton.com/classes>.

⁴² <https://www.ifit.com/blog/series-feature-costa-rica-transformative-yoga-series/>.

⁴³ <https://www.mirror.co/classes/yoga-flow>.

⁴⁴ <https://www.ifit.com/blog/strength-training-for-beginners>.

⁴⁵ <https://www.ifit.com/blog/get-big-results-from-short-workouts>.

⁴⁶ <https://www.mirror.co/classes/dance-cardio>.

⁴⁷ <https://www.ifit.com/blog/try-these-meditation-workouts-with-8-ifit-mind-trainers-and-guides>.

⁴⁸ <https://www.mirror.co/classes/meditation>.

⁴⁹ <https://www.ifit.com/blog/workout-series-december-2021>.

⁵⁰ <https://www.mirror.co/classes/bootcamp>.

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OUII makes similar arguments as DISH. *See* OBr. at 34. Specifically, OUII states that “[w]hile U.S. consumers may be impacted to some extent due to the lack of like or directly competitive products in the market, the infringed claims do not generally cover all fitness devices with streaming capabilities—they cover only a particular method of streaming content (i.e., adaptive, multi-bit rate streaming).” *Id.* OUII further argues that “both parties have now identified several third-party competitive products in their respective opening submissions.” OBr. (Reply) at 19. Regarding Respondents, OUII points out Respondents’ reference to products by Tonal, Hammerhead/Sram Karoo, Stryde, Sole, JAXJOX, Hydrow, Aviron, and Echelon. *See id.* at 19 (citing RBr. at 48 n. 14). Those products include various exercise bikes, treadmills, and rowers with displays for viewing streaming content. *See* RBr. at Exhs. 9–14.

The Commission finds that the remedial orders will not adversely affect the public health and welfare such that denying a remedy would be warranted. The Commission is issuing an LEO in this investigation which, unlike a general exclusion order, will apply only to infringing devices of the Remaining Respondents, not equipment from other manufacturers. *See Kyocera*, 545 F.3d at 1358 (holding that section 337 only “permits LEOs to exclude only the violating products of named respondents”). Moreover, while access to fitness equipment in the United States may be impacted to some extent due to exclusion of infringing articles, the infringed claims do not generally cover all fitness devices, or even all fitness devices with streaming capabilities—they cover only infringing apparatuses using a particular method of streaming content (i.e., adaptive, multi-bitrate streaming). The Commission also notes that the formerly-accused MIRROR products, which are terminated from the investigation due to the settlement between MIRROR and DISH, will be available to United States consumers.

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As DISH and OUII point out, consumers will still have access to numerous other ways of getting exercise, both those that involve streaming content as well as options that do not. *See* CBr. at 27–28, 31–34; OBr. (Reply) at 19. While these alternative products may not be exact replacements for excluded articles because they do not have the same equipment or the same interactive elements of the infringing devices, this difference is not sufficient to warrant denial of relief. The correct assessment is whether there are “reasonable substitutes for the devices subject to the exclusion order,” not whether “every consumer cannot obtain the exact device desired.” *Certain Elec. Digital Media Devices & Components Thereof*, Inv. No. 337-TA-796, Comm. Op. at 120 (Sept. 6, 2013) (“*Elec. Digital Media Devices*”); *see also Certain Table Saws Incorporating Active Injury Mitigating Tech. & Components Thereof*, Inv. No. 337-TA-965, Comm’n Op. at 9 (Feb. 1, 2017) (declaring that “products need not be identical to serve as reasonable substitutes for each other”).

Further, Respondents assert they are able to modify their products to render them non-infringing, and that they are able to do so within approximately five months. *See* RBr. at 34–35. Should Remaining Respondents do so, and obtain formal rulings from CBP or the Commission that their products no longer infringe, those products would not be covered by the LEO and CDOs. Moreover, customers who have already purchased fitness equipment can continue to receive software updates (because the remedial orders do not cover electronic transmission), as well as repairs and replacement under the service, repair, and replacement exemption the Commission is granting to the LEO and CDOs. Accordingly, the public health and welfare would not be adversely impacted by the remedial orders such that denying a remedy would be warranted based on the public health and welfare.

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2. Competitive Conditions in the United States Economy

Respondents argue that DISH's infringement allegations are broader than fitness devices because the allegations can allegedly reach any device that uses the adaptive bitrate video streaming functionality of ExoPlayer, HLS, fragmented MPEG and/or MPEG-DASH. *See* RBr. at 46–47; *see also, e.g.,* MStmt. at 3–4. Thus, Respondents argue that “to the extent such use is infringing, it implicates not only Respondents, but also numerous other streaming video providers in the U.S., some of whom *do compete with DISH.*” RBr. at 46–47 (Respondents' emphasis).

OUII states that it is not aware of any record evidence suggesting an adverse impact. *See* OBr. at 34–35. OUII declares that, to the extent Respondents allege that the remedial orders affect products of non-parties, DISH is not seeking a general exclusion order and thus the requested remedy would not affect those products. *See id.* at 35–36.

DISH argues that “[w]hen assessing competitive conditions in the U.S. economy, ‘the appropriate standard is not that no remedy should issue if every consumer cannot obtain *the exact device* desired that was found to infringe the patents at issue.’” CBr. at 29 (citing *Certain Elec. Digital Media Devices*, Comm. Op. at 120) (DISH's emphasis).

The Commission finds that competitive conditions in the United States economy would not be adversely affected by the Commission's remedy. As discussed above, there are reasonable substitutes for the devices subject to the exclusion order, such that exclusion of the Remaining Respondents' infringing devices will not adversely affect competitive conditions in the United States. Respondents contend that DISH's infringement allegations against products using standard implementations of third party ExoPlayer, HLS, fragmented MPEG and/or MPEG-DASH implicates “numerous other streaming video providers in the U.S., some of whom *do compete with DISH.*” RBr. at 46 (Respondents' emphasis). However, the requested

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remedial orders in this investigation are not directed to third parties because DISH has not requested a general exclusion order. *See Kyocera*, 545 F.3d at 1358; *see also Certain Mobile Devices, Associated Software, & Components Thereof*, Inv. No. 337-TA-744, Comm’n Op. at 30–31 (June 5, 2012) (“[T]he present limited exclusion order does not exclude all Android mobile devices, and that if a combination of Commission orders and district court rulings in the future leads to a significant constraint on the availability of mobile devices, the Commission has established procedures for modification or rescission of exclusion orders based on changed facts or public interest considerations.”). We also note that the streaming video providers that compete with DISH are not even sellers of the types of products, fitness devices, that are covered by the remedial orders.

3. Production of Like or Directly Competitive Articles in the United States

Respondents argue that DISH’s set-top boxes and Sling TV apps are not like or directly competitive products whose production could be impacted by any remedy issued in this investigation. *See RBr.* at 50. Respondents further assert that, even if they were, the set-top boxes are imported, not manufactured domestically. *See id.* at 50–51.

DISH argues that the record does not show domestic production of any like or directly competitive products that would be subject to its requested remedial orders, and thus no domestic production would be adversely affected by those orders. *See CBr.* at 36.

OUII declares that it is not aware of any evidence of record regarding the impact of the requested remedial orders on the production of like or directly competitive articles in the United States. *See OBr.* at 33. OUII asserts that the Accused Products are not manufactured in the United States. *Id.*

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The Commission finds that its remedy will not affect the production of like or directly competitive articles in the United States. The record does not indicate that any competitive products are manufactured in the United States, including the Accused Products and the domestic industry products.

4. United States Consumers

Respondents argue that existing United States customers would be impacted by the remedial orders to the extent those orders do not contain adequate exemptions for updates, service, repair, and replacement. *See* RBr. at 45–46. Respondents allege that they provide warranties for their products. *See id.* Respondents further argue that there are no adequate substitutes for their accused products. *See id.* at 49–50.

DISH argues that there will be no impact of the remedial orders on United States consumers. *See id.* at 40–41. DISH argues that there are many alternative fitness products available to consumers, including those of third parties. *See id.* at 29–35. DISH then asserts that the Commission should not deny a remedy merely because every consumer may not be able to obtain the exact device wanted, but rather, the Commission should consider, in the aggregate, whether there are reasonable substitutes. *See id.* (citing *Elec. Digital Media Devices*, Comm’n Op. at 120). DISH then declares that each respondent offers a mobile fitness application that can be used on their customers’ existing tablet or smart phone. *See id.* at 29–30.

OUII asserts that the requested remedial orders will not affect current owners of accused products. *See* OBr. at 28–30. OUII reasons that the continued streaming of content would not fall within the plain language of the remedial orders. *See id.* at 28–30. OUII supports Respondents’ request for a service and repair exception. *See* OBr. (Reply) at 17. OUII further argues that both DISH and Respondents have “identified several third party competitive products in their respective opening submissions.” OBr. (Reply) at 19. OUII additionally

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points out that there are relatively straightforward design changes available to Respondents that would render their products non-infringing, such as modifying those products to stream at a constant bitrate. *See* OBr. at 32.

The Commission has determined to include exemptions to the remedial orders for repair or, under warranty terms, replacement of products purchased by consumers prior to the date of the remedial orders.⁵¹ Here, the Commission considers the public interest regarding potential

⁵¹ Commissioner Karpel concurs with the majority that an exemption from the remedial orders is appropriate under the facts of this investigation to permit the Respondents to import and use component parts for service and repair of damaged fitness devices that are in the hands of U.S. consumers. This exemption is supported by the record and is necessary to mitigate harm to U.S. consumers. However, Respondents' argument regarding harm to U.S. consumers to the ALJ and the Commission in this respect was restricted to components: "[i]f Respondents' customers are denied service, repairs or replacement parts, customers owning an Accused Product would be harmed, for example by losing access to warranty repairs." RPHBr. at 296; RBr. at 40 ("Respondents' customers in the U.S. would be harmed by losing access to warranty repairs or other repairs to which they're contractually entitled, for example under an extended protection plan."); *see also* OBr. (Reply) at 16 ("Thus, U.S. consumers would be harmed if Respondents could not fulfill their warranty obligations, which would potentially render existing owner's products inoperable.").

While Respondents would benefit from an exemption that permits them to continue to import infringing fitness devices so that they could avoid breaching their warranty obligations, the warranties of record do not necessarily require Respondents to supply as a replacement the identical fitness device purchased by the consumer. *See, e.g.*, RX-0094 at 20 ("If a defect arises in the Peloton Bike or a warranted component within the applicable Limited Warranty period, the purchaser's sole and exclusive remedy is for Peloton to, at Peloton's discretion to the extent permitted by law, either replace or repair the defective or malfunctioning Peloton Bike or component with the same or a comparable model."); <https://www.nordictrack.com/warranty-terms-and-conditions> (cited in OBr. (Reply) at 16 n.6) ("iFIT's obligation under this warranty is limited to repairing or replacing, at iFIT's discretion, the product through one of its authorized service providers."). Given Respondents retain discretion to replace fitness devices with alternative non-infringing fitness devices, she finds the record lacks evidence of harm to U.S. consumers to warrant an exemption for replacement of fitness devices in contrast to the record evidence of the harm to consumers who need access to component parts for service and repair of their fitness devices as discussed in the opinion. *See Certain Cloud-Connected Wood-Pellet Grills & Components Thereof*, Inv. No. 337-TA-1237, Comm'n Op. at 17–18 (May 24, 2022) (denying request for exemption for replacement parts where the evidence in the record is insufficient to support specific harm to consumers such that "without such facts, any alleged

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harm to U.S. consumers by virtue of our remedial orders and in so doing considers consumers' expectation regarding the ability to obtain service, repair, and, if provided under warranty terms, replacement of the articles at issue at the time of purchase. Relevant to such expectation is Respondents' offering of warranties and the terms of those warranties. *See* RBr. (Reply) at 16 (citing RX-0094 (Peloton Bike Manual)); OBr. (Reply) at 16 (citing <https://www.nordictrack.com/warranty-terms-and-conditions>). The Peloton Bike Manual includes various components and the warranty terms for those components. *See, e.g.*, RX-0094 (Peloton Bike Manual) at 20 (declaring, for example, that the touchscreen has a 12-month warranty). OUII points out that Peloton appears to offer similar warranties for its other products and the other Respondents offer similar warranties. *See* OBr. (Reply) at 16, 16 n.8 (citing to a NordicTrack (an iFIT entity) warranty that includes repair or replacement).⁵² Also relevant to

harm to consumers is entirely speculative.”); *Certain Optoelectronic Devices for Fiber Optic Communications, Components Thereof, & Prods. Containing the Same*, Inv. No. 337-TA-860, Comm'n Op. at 32–33 (May 9, 2014) (denying request for exemption due to lack of evidence of specific harm to respondent's customers after “acknowledg[ing] the concerns raised by Respondents that there exists the possibility that one or more customers may potentially” be disadvantaged). Indeed, Remaining Respondents indicated in their submission of December 2, 2022, that they are working on a redesign that was anticipated to be operational within 120 days. *See* RBr. at 34–35. Moreover, as the Commission found above, there are several alternative products that are reasonable substitutes for the infringing fitness devices.

Inasmuch as Respondents retain discretion to provide consumers with any suitable non-infringing fitness device as a replacement for a defective fitness device under the warranties of record for the duration of the Commission's remedial orders, Commissioner Karpel finds the record does not show consumer harm to justify the replacement exemption. Since an adjudicated redesign is but one such option that Respondents may provide to consumers as a replacement, she therefore disagrees with the premise of footnote 52.

⁵² As discussed *supra* at section V.A.1.c, Respondents have not identified or explained how certain components of covered articles are non-infringing. More significantly, no components or covered articles have been adjudicated as non-infringing. Because there are no redesign devices approved at this time, the majority observes that Commissioner Karpel's approach would mean Respondents cannot replace devices under warranty unless and until the Respondents adjudicate a redesigned product at CBP or the Commission as non-infringing.

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consumer expectations is the significant cost of the accused products. *See, e.g.*, RX-0096 (Peloton Bike Website) at 1 (offering the Peloton Bike for sale at \$1,495). Corroborating the significant cost is that Peloton offers financing options for its bike. *See* RX-0077 (Peloton Financing). Further relevant is the complexity of the Accused Products and the difficulty faced by consumers if they were forced to remove from their homes equipment that would no longer be useful if access to repair parts were not available. In view of the harm to U.S. consumers who have these reasonable expectations that their substantial investment in an infringing device would not be lost due to an inability to obtain parts needed for service or repair, the Commission includes in the issued remedial orders an exemption for the provision of parts for service and repair of infringing articles purchased by consumers prior to the date of the remedial orders. This exemption applies to components regardless of whether the infringing device is subject to warranty. The Commission additionally includes an exemption to replace infringing articles as a whole (*e.g.*, a Peloton Bike) while those articles are under warranty to the extent provided by the warranty. This exemption does not extend to replace whole articles that are not under warranty.⁵³ Allowing for replacement under warranty, but not after the end of the warranty term, is consistent with the reasonable expectations of consumers. On the other hand, permitting replacement after the termination of a warranty would essentially allow consumers to purchase a new infringing article. At least for these reasons, the Commission has determined to

⁵³ Commissioner Schmidlein would extend the exemption for replacement of the whole article in this case to include those that are not currently under warranty. She agrees with the majority that the reasonable expectations of consumers include replacement of the infringing component (the integrated video display) if needed when not under warranty. In her view, as such, those expectations would also include replacement of the whole article when not under warranty if for some reason it was not possible to just replace the infringing component (*e.g.*, if the malfunctioning video display could not be removed or reattached to the fitness equipment for some reason).

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provide exemptions to the remedial orders for parts necessary to service and repair infringing articles and, if provided for under warranty, for replacement of infringing articles, to reduce the orders' impact on U.S. consumers. These exemptions permit the importation and sale of components needed for service and repair, or if required by warranty, replacement, of infringing fitness devices, and mitigates harm to U.S. consumers who have made substantial investments in those devices which would be lost—through no fault of their own—were they not able to access components and replacement devices needed for service and repair.

With these exemptions in place, the Commission's remedy will not adversely affect United States consumers to the extent that rises to a public interest concern for the remedial orders. As discussed in more detail above, consumers have alternatives to the infringing products. *See, e.g., Certain Personal Data & Mobile Communications Devices & Related Software*, Inv. No. 337-TA-710, Comm'n Op. at 69 (Dec. 29, 2011) (“[T]he mere constriction of choice cannot be a sufficient basis for denying the issuance of an exclusion order.”).

C. Bonding

If the Commission enters an exclusion order or a CDO, a respondent may continue to import and sell its products during the 60-day period of Presidential review under a bond in an amount determined by the Commission to be “sufficient to protect the complainant from any injury.” 19 U.S.C. § 1337(j)(3); *see also* 19 C.F.R. § 210.50(a)(3). When reliable price information is available in the record, the Commission has often set the bond in an amount that would eliminate the price differential between the domestic product and the imported, infringing product. *See Microsphere Adhesives*, Comm'n Op. at 24. The Commission also has used a reasonable royalty rate to set the bond amount where a reasonable royalty rate could be ascertained from the evidence in the record. *See, e.g., Certain Audio Digital-to-Analog Converters & Prods. Containing Same*, Inv. No. 337-TA-499, Comm'n Op. at 25 (Mar. 3,

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2005). Where the record establishes that the calculation of a price differential is impractical or there is insufficient evidence in the record to determine a reasonable royalty, the Commission has imposed a one hundred percent (100%) bond. *See, e.g., Certain Liquid Crystal Display Modules, Prods. Containing Same, & Methods Using the Same*, Inv. No. 337-TA-634, Comm’n Op. at 6–7 (Nov. 24, 2009). The complainant, however, bears the burden of establishing the need for a bond. *Certain Rubber Antidegradants, Components Thereof & Prods. Containing Same*, Inv. No. 337-TA-533, USITC Pub. No. 3975, Comm’n Op. at 40 (July 21, 2006).

Before the CALJ, DISH requested a one hundred percent (100%) bond. *See, e.g.,* RD at 260–61. The RD recommended that no bond issue, reasoning that “DISH’s Pre-Hearing brief did not contain any analysis as to how it allegedly suffered an injury that warrants a bond.” RD at 261.

DISH’s briefing before the Commission does not request a bond. Because DISH does not request bond, the Commission has determined to set a bond in the amount of zero percent (0%) of the entered value of the covered products (*i.e.*, no bond) during the period of Presidential Review.

VI. CONCLUSION

In sum, the Commission finds a violation of section 337 by the Remaining Respondents as to the asserted claims of the ’156, ’554, and ’555 patents, but not as to the asserted claims of the ’564 patent. As a remedy, the Commission has determined to issue an LEO and CDOs to the Remaining Respondents. The Commission also finds that the public interest factors do not preclude the issuance of this remedy. The Commission has further determined to set a bond in the amount of zero percent (0%) of the entered value of the covered products (*i.e.*, no bond) during the period of Presidential Review. The Commission has additionally determined to grant a joint motion to terminate the investigation as to MIRROR.

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By order of the Commission.

A handwritten signature in black ink, appearing to read 'LRB', is positioned above the printed name and title.

Lisa R. Barton
Secretary to the Commission

Issued: March 23, 2023

EXHIBIT V

Customer Terms and Conditions

Date Last Modified: August 20, 2023

Before Subscriber's transaction can be completed, Subscriber must read and agree to these terms and conditions. By applying for access and or services from this [website](#), Subscriber is agreeing to these terms and conditions, and is agreeing to be legally bound by them. This agreement is subject to change at any time. Changes are effective when posted on this website without notice upon each subscriber.

0. Preamble

1. Subscriber data is for internal use only and will be treated confidential.
2. All transactions are SSL encrypted.
3. Subscriber's credit card will be billed immediately after purchase.
4. After purchase Subscriber will receive an email notification with all payment details.
The contract is closed between customer and shop as soon as the order is submitted
5. All orders will be processed immediately.
6. All questions will be answered within two working days.
7. We recommend printing out the transaction data and Terms and Conditions and to keep them at an easily accessible place.
8. Prohibited for people under legal age in their respective country.

1. Definitions

1. "**Member**" or "**Membership**" shall mean the subscriber or user of a valid username and password for the website during the term of membership.
2. "**AYLO Billing**" shall mean AYLO Billing Limited, and/or any of the companies billing the Subscriber including any additional billing companies used by AYLO Billing or changes thereof.
3. "**AYLO Premium**" or "**Merchant**" or "**Controller**" shall mean AYLO Premium Ltd, the controller of the Site (as defined below)
4. "**Site**" shall mean the website for which subscriber is purchasing a username and password in order to access the website and its materials and obtain the benefits of membership.
5. "**Subscriber**" shall mean the user of the services of the Site and holder of a valid username and password for the Site.
6. "**Access rights**" shall mean the combination of unique username and password that is used to access the Site. An access rights is a license to use the Site for a period of time that is specified.
7. "**Bookmarking**" shall mean a URL placed into a temporary file on the subscriber's browser so that the subscriber may return to that page at a future date without having to type in its username and password.

2. Description of Services

AYLO Premium will provide one access right to access the Site and its materials for which Subscriber is purchasing a membership.

3. Billing

Probiller.com, MGBill, Vendo, Segpay, WTS, or others (depending on Subscriber geographical location) may appear on Subscriber's credit card, bank statement, or phone bill for all applicable charges. If multiple venues are joined utilizing any payment method, Subscriber's statement will list each individual purchase comprising the

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transaction. AYLO Billing or Controller may include other information on Subscriber statement based on credit card association, telephone regulation, NACHA and any other mandated rules and regulations. If Subscriber elects to use a checking account to purchase a subscription to this Site, a debit will be executed on their checking account.

4. Tax

Value-Added Tax (VAT), Sales Tax or other excise tax may be included in, or added to, your purchase depending on your country, state, territory, city, or on other applicable local regulations. Tax rates may vary accordingly.

5. Payment / Fee

The Site may impose periodic subscription fees at the time of the initial enrolment for subscription. Subscriber is solely responsible for such fees according to the terms and conditions of such Site.

6. Automatic Recurring Billing (If Selected By Subscriber On The Sign-Up Page)

In accordance with the terms and conditions of the Site subscription fees will be automatically renewed at or after the end of the original term selected, unless notice of cancellation is received from the Subscriber. In the event of a failed attempt to charge the Subscriber's payment method (for example, if the payment method has expired or has been declined), AYLO Billing reserves the right to retry charging the Subscriber's payment method for the amount due or an amount lesser than the amount due, provided that any such attempt to charge a lower amount may be made on a one-time basis, and AYLO Billing will resume billing the Subscriber for the subscription at the full amount agreed to upon enrollment. AYLO Billing may suspend or cancel Subscriber's membership if AYLO Billing is unable to successfully charge a valid payment method. An administration fee of up to \$2.00 may be applied in order to keep a subscription temporarily active until the next attempt to process the recurring payment.

7. Electronic Receipt

Subscribers will receive an email receipt to their email provided upon initial subscription. Subscriber may request a copy of the account of charges of their membership to the Site, but neither Controller nor AYLO Billing guarantee the availability of such records more than 365 days after Subscription date. Requests must be made directly to Controller. To contact the Controller, refer to Customer Support links on the Site, or [click here](#).

8. Agreed upon Method of Communication

AYLO Billing and the Subscriber agree that a transaction receipt will be provided via email to the Subscriber's address provided at the time of initial enrolment. Subsequent transactional updates may be communicated to the Subscriber through the members' area on the Site (as applicable) upon login to ensure receipt in the event Subscriber has unsubscribed from email communications.

9. Cancellation

At any time, and without cause, subscription to the service may be terminated by either: AYLO Billing, the Controller, or the Subscriber upon notification of the other by electronic or conventional mail, by chat, or by telephone. Subscribers are liable for charges incurred until the date of the termination. Subscribers may cancel at any time by going to <https://support.brazzers.com/cancel> and clicking on "Cancel Online" or by contacting our

support department through the contact options listed on <https://support.brazzers.com> or online directly with the Site by following the links provided in their transaction receipts.

10. Refunds

Refunds for purchases or recurring charges may be requested by contacting customer support. Refunds or credits will not be issued for partially used Memberships. Cancellation for all future recurring billing may be requested in accordance with Section 9, Cancellation. AYLO Billing reserves the right to grant a refund or a credit applicable to purchases to the Site at its discretion. The decision to refund a charge does not imply the obligation to issue additional future refunds. Should a refund be issued by AYLO Billing for any reason, it will be credited solely to the payment method used in the original transaction. AYLO Billing will not issue refunds by cash, check, or to another payment mechanism.

11. Cardholder Disputes/Chargebacks

All chargebacks are thoroughly investigated and may prevent future purchases with AYLO Billing or Controller, given the circumstances. Fraud claims may result in AYLO Billing or Controller contacting Subscriber's issuer to protect Subscriber and prevent future fraudulent charges to Subscriber card.

12. Authorization of Use

Subscribers of the Site are hereby authorized a single access right to access the service or material located on the Site. This access rights shall be granted for sole use to one Subscriber. All memberships are provided for personal use and shall not be used for any commercial purposes or by any other third parties. Commercial use of either the Site or any material found within is strictly prohibited unless explicitly authorized by the Site. No material within the Site may be transferred to any other person or entity, whether commercial or non-commercial. No material within the Site may be distributed through peer-to-peer networks or any other file sharing platforms. In addition, materials may not be modified, or altered. Materials may not be displayed publicly, or used for any rental, sale, or display. Materials shall extend to copyright, trademarks, or other proprietary notices there from. AYLO Billing and Controller reserve the right to terminate this access rights at any time if the terms of this agreement are breached. In the case that the terms are breached, subscriber will be required to immediately destroy any information or material printed, downloaded, or otherwise copied from the Site.

13. Transfer of Access Rights

Access to the Site is through a combination of a username and a password. Subscribers may not under any circumstances release their access rights to any other person and are required to keep their access rights strictly confidential. Controller will not release passwords for any reason, to anyone other than the Subscriber, except as may be specifically required by law or court order. Unauthorized access to the Site is a breach of this Agreement. Subscribers acknowledge that the controller of the Site may track through the use of special software each Subscriber's entry to the Site. If any breach of security, theft or loss of access rights, or unauthorized disclosure of access rights information occurs, Subscriber must immediately notify AYLO Billing or the Controller of said security breach. Subscriber will remain liable for unauthorized use of service until AYLO Billing or Controller is notified of the security breach by e-mail or telephone.

14. Sanction and Approval of Adult Material

This Site contains age-restricted materials including nudity and explicit depictions of sexual activity. If Subscriber is under the age of 18 years, or under the age of majority in the location from where access to the Site

is attempted, Subscriber does not have authorization or permission to enter or access any of its materials. If Subscriber is over the age of 18 years or over the age of majority in the location from where access to the Site is attempted, Subscriber hereby acknowledges and understands the explicit sexual nature of the materials available on this Site, and agrees to comply with these terms and conditions.

You also understand and agree that, after any purchases made on the Site, you may be asked to prove or verify your age. If you are unsuccessful (i.e. you are found to be under eighteen (18) years of age or the age of majority in the location where you are attempting to verify from) or unable to do so, your purchase will be cancelled and a refund may be issued to you, in a discretionary manner. Upon such failure to verify or prove your age we also reserve the right, in our sole and final discretion, to prevent you from entering or re-entering the Site by, for example but not limited to, terminating your account.

15. Supplementary Terms and Conditions

The Site may have additional Terms and Conditions that are an integral part of their offering to the Subscriber and are in addition to these Terms and Conditions. Such Terms and Conditions as listed on the Site will in no way invalidate any of the Terms and Conditions listed here. This Agreement shall be construed and enforced in accordance with the laws of the Republic of Cyprus applicable to contracts negotiated, executed, and wholly performed within said country. Disputes arising hereunder shall be settled in the Republic of Cyprus. Transactions are governed by country of merchant of record and use of the membership/websites governed by laws stated in the terms on the website from which the purchase was made.

16. Severability

If any provision of this Agreement shall be held to be invalid or unenforceable for any reason, the remaining provisions shall continue to be valid and enforceable. If a court finds that any of this Agreement is invalid or unenforceable, but that by limiting such provision it would become valid or enforceable, then such provision shall be deemed to be written, construed, and enforced as so limited.

17. Notice

Notices by the Site to subscribers may be given by means of electronic messages through the Site, by a general posting on the Site, or by conventional mail. Notices by subscribers may be given by electronic messages, conventional mail, telephone, or fax unless otherwise specified in the Agreement. All questions, complaints, or notices regarding the Site must be directed to Controller. All cancellations of service to the Site must also be directed to Controller.

Questions and Contact Information

All questions to Controller regarding these terms and conditions must be directed to:

For billing issues: brazzersbilling@probiller.com

For support/technical issues: brazzerssupport@probiller.com

For marketing issues: support@probiller.com

18. Disclaimer

USER UNDERSTANDS THAT THE MERCHANT CANNOT AND DOES NOT GUARANTEE OR WARRANT THAT FILES AVAILABLE FOR DOWNLOADING FROM THE INTERNET WILL BE FREE OF VIRUSES, WORMS, TROJAN HORSES, OR OTHER CODE THAT MAY MANIFEST CONTAMINATING OR DESTRUCTIVE PROPERTIES. USER IS RESPONSIBLE FOR IMPLEMENTING SUFFICIENT

PROCEDURES AND CHECKPOINTS TO SATISFY YOUR PARTICULAR REQUIREMENTS FOR ACCURACY OF DATA INPUT AND OUTPUT, AND FOR MAINTAINING A MEANS EXTERNAL TO THE WEBSITE FOR THE RECONSTRUCTION OF ANY LOST DATA. THE MERCHANT DOES NOT ASSUME ANY RESPONSIBILITY OR RISK FOR YOUR USE OF THE INTERNET.

USERS USE OF THE WEBSITE IS AT THEIR OWN RISK. THE CONTENT IS PROVIDED "AS IS" AND WITHOUT WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED. THE MERCHANT DISCLAIMS ALL WARRANTIES, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, OR NON-INFRINGEMENT. THE MERCHANT DOES NOT WARRANT THAT THE FUNCTIONS OR CONTENT CONTAINED ON THE WEBSITE WILL BE UNINTERRUPTED OR ERROR-FREE, THAT DEFECTS WILL BE CORRECTED, OR THAT THE WEBSITE OR THE SERVER THAT MAKES IT AVAILABLE ARE FREE OF VIRUSES OR OTHER HARMFUL COMPONENTS. THE MERCHANT DOES NOT WARRANT OR MAKE ANY REPRESENTATION REGARDING USE, OR THE RESULT OF USE, OF THE CONTENT IN TERMS OF ACCURACY, RELIABILITY, OR OTHERWISE. THE CONTENT MAY INCLUDE TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS, AND THE WEBSITE MAY MAKE CHANGES OR IMPROVEMENTS AT ANY TIME. USER, AND NOT MERCHANT, ASSUME THE ENTIRE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION IN THE EVENT OF ANY LOSS OR DAMAGE ARISING FROM THE USE OF THE WEBSITE OR ITS CONTENT. THE MERCHANT MAKES NO WARRANTIES THAT YOUR USE OF THE CONTENT WILL NOT INFRINGE THE RIGHTS OF OTHERS AND ASSUMES NO LIABILITY OR RESPONSIBILITY FOR ERRORS OR OMISSIONS IN SUCH CONTENT. THE MERCHANT DOES NOT WARRANT OR MAKE ANY REPRESENTATIONS REGARDING THE CONTENT'S APPROPRIATENESS OR AUTHORIZATION FOR USE IN ALL COUNTRIES, STATES, PROVINCES, COUNTY, OR ANY OTHER JURISDICTIONS. IF YOU CHOOSE TO ACCESS THE WEBSITE, YOU DO SO ON YOUR OWN INITIATIVE AND RISK AND ARE RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE LAWS.

19. Subscription Fees and User Communication

Subscription and Membership fees to Site are subject to change at any time at the sole and absolute discretion of AYLO Billing and/or the Controller. The official standard membership rates for the Site shall be set forth at the following link: probiller.com. The current monthly membership rate which will appear on Subscriber credit card bill, will be debited from Subscriber account, charged to Subscriber telephone, etc., depending on Subscriber, choice of payment means.

"OPT-IN AND USER COMMUNICATION" – Subscriber's expressly and specifically acknowledges and agrees that his email address or other means of communicating with subscriber may be used to send him offers, information or any other commercially oriented emails or other means of communications. More specifically, some offers may be presented to the subscriber via email campaigns or other means of communications with the option to express the subscriber's preference by either clicking or entering "accept" (alternatively "yes") or "decline" (alternatively "no"). By selecting or clicking the "accept" or "yes", the subscriber indicates that the subscriber "OPTS-IN" to that offer and thereby agrees and assents that the subscriber's personal information, including its email address and data may be used for that matter or disclosed to third-parties."

"OPT-OUT AND USER COMMUNICATION" – Subscriber's expressly and specifically acknowledges and agrees that his email address or other means of communicating with subscriber may be used to send him offers, information or any other commercially oriented emails or other means of communications. More specifically, other offers may be presented to the subscriber via email campaigns or other means of communications with a pre-selected preference or choice. If the subscriber does not deselect the pre-selected preference of choice (i.e., "OPT-OUT" of the offer) then the Site may transfer the subscriber's personal profile information to the third-party service or content provider making the offer. If the subscriber deselects the pre-selected preference, then no personal information about the subscriber may be disclosed to any third-party service or content provider.

20. Sponsors, Advertisers and Third Parties

The Site may provide links to sponsor, advertiser, or other third-party websites that are not owned or controlled by the Merchant. Inclusion of, linking to, or permitting the use or installation of any third-party website, applications, software, content, or advertising does not imply approval or endorsement thereof by the Merchant. The Merchant has no control over, and assumes no responsibility for, the content, privacy policies, or practices of any third parties. By accessing or using the Site, you agree to release The Merchant from any and all liability arising from your use of any third-party website, content, service, or software accessed through the Site. Your communications or dealings with, or participation in promotions of, sponsors, advertisers, or other third parties found through the Site, are solely between you and such third parties. You agree that The Merchant shall not be responsible or liable for any loss or damage of any sort incurred as the result of any dealings with such sponsors, third parties or advertisers, or as the result of their presence in the Site.

EXHIBIT W

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Attorneys for Defendants

**UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
WESTERN DIVISION**

JANE DOE on behalf of herself and all
other similarly situated,

Plaintiffs,

v.

MINDGEEK USA INCORPORATED,
MINDGEEK S.A.R.L., MG
FREESITES, LTD (D/B/A PORNHUB),
MG FREESITES II, LTD, MG
CONTENT RT LIMITED, AND 9219-
1568 QUEBEC, INC. (D/B/A
MINDGEEK),

Defendants.

CASE NO. 2:22-CV-01016-DMG-PVC

Judicial Officer: Dolly M. Gee
Courtroom: 8C

**DECLARATION OF ANDREAS
ALKIVIADES ANDREOU IN
SUPPORT OF DEFENDANTS'
MOTION TO DISMISS**

Hearing: June 17, 2022
Time: 9:30 a.m.

1 I, Andreas Alkiviades Andreou, hereby declare as follows:

2 1. I am employed by MG CY Holdings Ltd as Director of Corporate
3 Finance, a position which I have held since 2013. I have also served as a Class A
4 manager (the equivalent of a director) for MindGeek S.à r.l. since 2016.

5 2. Through my employment and experience, I am familiar with the
6 corporate entities named in Plaintiff's Amended Complaint – MindGeek USA
7 Incorporated, MindGeek S.à r.l., MG Freesites Ltd, MG Freesites II Ltd, MG
8 Content RT Limited and 9219-1568 Quebec Inc. (the "MindGeek corporate
9 entities") – and have been since 2016, the year Plaintiff alleges a video depicting
10 her was uploaded to Pornhub, a website operated by MG Freesites Ltd. Almost
11 every day since 2016, as part of my regular job responsibilities, I have dealt and
12 continue to deal with issues involving these legal entities and their affiliates
13 (collectively "MindGeek") in some capacity and therefore have personal knowledge
14 of their corporate histories.

15 3. I understand Plaintiff claims that "MindGeek entities operate as a
16 single business enterprise, comingling their funds and other assets to shelter and
17 avoid liabilities and to hide the identity of their owners" Am. Compl. ¶ 15. As
18 set forth in more detail below, this allegation is completely false.

19 4. Defendants have not operated and do not operate as a single business
20 entity commingling funds but instead have existed and operated as distinct legal
21 entities since before at least 2016.

22 5. MindGeek S.à r.l. is and has been since before 2016, a private limited
23 liability company (société à responsabilité limitée) incorporated under the laws of
24 Luxembourg, having its registered office at 32, boulevard Royal, L-2449
25 Luxembourg and registered with the Luxembourg Register of Commerce and
26 Companies (R.C.S. Luxembourg) ("RCS") under number B 181337.

1 6. MindGeek S.à r.l. has served during the relevant period as the ultimate
2 parent corporation of MindGeek USA Incorporated, MG Freesites Ltd, MG
3 Freesites II Ltd, MG Content RT Limited, and 9219-1568 Quebec Inc.

4 7. MindGeek S.à r.l. has been and is nothing more than a holding
5 company, without any employees or operations of its own. MindGeek S.à r.l. has
6 never had any offices or employees in the State of California, let alone the United
7 States. MindGeek S.à r.l. has never exercised control over the day-to-day
8 operations of the other MindGeek corporate entities.

9 8. MindGeek S.à r.l. has been during the relevant period adequately
10 capitalized, both possessing its own bank accounts and serving as a party to and
11 responsible for fulfilling its own contracts. MindGeek S.à r.l. has always had the
12 equivalent of its own designated board of directors, referred to as a board of
13 managers, and observes all necessary corporate formalities. The current members
14 of the board of managers are Anis Baba, Claude Favre and myself.

15 9. MG Freesites Ltd is and has been since before 2016 a limited liability
16 company organized and operating under the laws of the Republic of Cyprus, having
17 its head office at 195-197 Old Nicosia-Limassol Road, Block 1 Dali Industrial
18 Zone, Cyprus.

19 10. MG Freesites Ltd has during the relevant period been responsible for
20 operating tubesites, including Pornhub.

21 11. MG Freesites Ltd has not during the relevant period ever had any
22 offices or employees in the State of California, or in the United States.

23 12. MG Freesites Ltd has during the relevant period been adequately
24 capitalized, both possessing its own bank accounts and serving as a party to and
25 responsible for fulfilling its own contracts. MG Freesites Ltd also has had during
26 the relevant period the equivalent of its own designated board of directors, referred
27 to as a board of managers, and observes all necessary corporate formalities. The
28

1 current members of the board of managers are Anis Baba, Constantine Georgoude,
2 Charme Management Ltd and myself.

3 13. MindGeek USA Inc. is and has been since before 2016, a corporation
4 incorporated under the laws of the State of Delaware, having its principal executive
5 office in California. The current address of that office is 21800 Oxnard Street,
6 Suite 150, Woodland Hills, California 91367 United States of America.

7 14. MindGeek USA Incorporated's sole function during the relevant
8 period has been to distribute DVD-based content pursuant to the terms of one
9 contract. MindGeek USA Incorporated has not created, solicited, posted, managed,
10 or had any other involvement with the website content at issue in the instant case.

11 15. MindGeek USA Incorporated has during the relevant period been
12 adequately capitalized, both possessing its own bank accounts and serving as a
13 party to and responsible for fulfilling its own contracts. MindGeek USA
14 Incorporated also has had during the relevant period its own designated board of
15 directors and observed all necessary corporate formalities. Currently, the sole
16 director of MindGeek USA Incorporated is Andrew Link.

17 16. 9219-1568 Quebec Inc. is and has been since before 2016 a corporation
18 organized and operating under the laws of the Province of Quebec, Canada, having
19 its head office at 7777 Decarie Boulevard, Montreal, Quebec H4P-2H2.

20 17. 9219-1568 Quebec Inc. has during the relevant period been a service
21 provider to MG Freesites Ltd and other affiliates. Those services have been and are
22 provided pursuant to written agreements that respect the separateness of the service
23 provider and the service receiver.

24 18. 9219-1568 Quebec Inc. has not had during the relevant period any
25 offices in the State of California, or in the United States. It previously had two
26 employees in the United States, not in California, who provided services to
27 MindGeek's paysite businesses, not to MindGeek's tubesites, which are at issue in
28 this litigation.

1 19. 9219-1568 Quebec Inc. has during the relevant period been adequately
2 capitalized, both possessing its own bank accounts and serving as a party to and
3 responsible for fulfilling its own contracts.

4 20. 9219-1568 Quebec Inc. also has had during the relevant period its own
5 designated board of directors and observed all necessary corporate formalities. The
6 current members of the board of directors are Feras Antoon, Constantine
7 Georgoude, Polina Hadjivasilliou, David Tassillo and myself.

8 21. MG Freesites II Ltd was an entity that was organized under the laws of
9 the Republic of Cyprus, with its head office at 195-197 Old Nicosia-Limassol
10 Road, Block 1 Dali Industrial Zone, Cyprus.

11 22. MG Freesites II Ltd did not, during the relevant period, ever have any
12 offices or employees in the State of California, or in the United States.

13 23. MG Freesites II Ltd operated certain tubesites, including Youporn.com
14 and Xtube.com, but ceased all operations on December 31, 2018 after assigning all
15 of its assets and liabilities to MG Freesites Ltd. MG Freesites II Ltd was
16 subsequently dissolved in 2020.

17 24. Prior to ceasing operations and assigning its assets and liabilities, MG
18 Freesites II Ltd was, during the relevant period, adequately capitalized, both
19 possessing its own bank accounts and serving as a party to and responsible for
20 fulfilling its own contracts. MG Freesites II Ltd also had during the relevant period
21 the equivalent of its own designated board of directors, referred to as a board of
22 managers, and observes all necessary corporate formalities.

23 25. MG Content RT Limited is an entity organized under the laws of the
24 Republic of Ireland, with its principal place of business at 195-197 Old Nicosia-
25 Limassol Road, Block 1 Dali Industrial Zone, Cyprus.

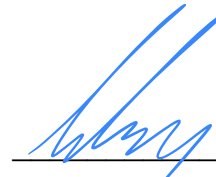
26 26. MG Content RT Limited did not, during the relevant period, ever have
27 any offices or employees in the State of California, or in the United States.
28

1 27. MG Content RT Limited operated the tubesite RedTube.com, but
2 ceased all operations on December 31, 2018 after assigning all of its assets and
3 liabilities to MG Freesites Ltd. MG Content RT Limited is in the process of
4 finalizing its liquidation and dissolution with the Irish government.

5 28. Prior to ceasing operations and assigning its assets and liabilities, MG
6 Content RT Limited was, during the relevant period, adequately capitalized, both
7 possessing its own bank accounts and serving as a party to and responsible for
8 fulfilling its own contracts. MG Content RT Limited also had during the relevant
9 period the equivalent of its own designated board of directors, referred to as a board
10 of managers, and observes all necessary corporate formalities.

11
12 I declare under penalty of perjury under the laws of the United States of
13 America that the foregoing is true and correct.

14
15 Date: May 16, 2022



16 Andreas Alkiviades Andreou

EXHIBIT X

**UNITED STATES DISTRICT COURT
DISTRICT OF SOUTH CAROLINA
SPARTANBURG DIVISION**

JANE DOES 1-9,

Plaintiffs,

v.

COLLINS MURPHY, SHARON
HAMMONDS, BRENDA F. WATKINS,
LIMESTONE UNIVERSITY, MG
FREESITES, LTD., d/b/a PORNHUB.COM,
MG FREESITES II LTD., MINDGEEK
S.A.R.L., MINDGEEK USA, INC., MG
BILLING LTD., and HAMMY MEDIA LTD.
d/b/a XHAMSTER.COM, TRAFFICSTARS
LTD., WISEBITS LTD, XHAMSTER IP
HOLDINGS LTD, WISEBITS IP LTD,

Defendants.

CASE NO. 7:20-CV-00947-DCC

**DECLARATION OF ANDREAS
ALKIVIADES ANDREOU IN SUPPORT
OF DEFENDANTS MINDGEEK S.A.R.L.,
MINDGEEK USA INC. AND MG
BILLING LTD'S MOTION TO DISMISS
PLAINTIFFS' FIFTH AMENDED
COMPLAINT**

I, Andreas Alkiviades Andreou, hereby declare as follows:

1. I am employed by MG CY Holdings Ltd as Director of Corporate Finance. I have worked for MG CY Holdings Ltd or its predecessor in this position since 2013. I have also served as a Class A manager (the equivalent of a director) for MindGeek S.à.r.l. since 2016.

2. Through my employment and experience, I am familiar with the corporate structure and operations of all the existing corporate entities named in Plaintiffs' Complaint – MindGeek S.à.r.l., MG Freesites II Ltd., MindGeek USA Incorporated, and MG Billing Ltd (the “MindGeek corporate entities”). Almost every day, as part of my regular job responsibilities, I deal with issues involving the corporate structure of these legal entities in some capacity.

3. I have reviewed the Fifth Amended Complaint filed in the instant action and am familiar with the allegations made regarding the structure and operations of the MindGeek corporate entities.

4. MindGeek S.à.r.l. is a private limited liability company (société à responsabilité limitée) incorporated under the laws of Luxembourg, having its registered office at 32, boulevard Royal, L-2449 Luxembourg and registered with the Luxembourg Register of Commerce and Companies (R.C.S. Luxembourg) ("RCS") under number B 181337.

5. MindGeek S.à.r.l. serves as the ultimate parent corporation of MindGeek USA Incorporated and MG Billings Ltd. However, MindGeek S.à.r.l. does not exercise any control over the day-to-day decisions of those entities, or any other MindGeek corporate entities.

6. MindGeek S.à.r.l. is nothing more than a holding company, without any employees or operations of its own, that directly and indirectly owns certain affiliated entities. MindGeek S.à.r.l. does not have any offices or employees in the State of South Carolina, let alone the United States.

7. MindGeek S.à.r.l. is adequately capitalized, both possessing its own bank accounts and serving as a party to and responsible for fulfilling its own contracts. MindGeek S.à.r.l. also has the equivalent of its own designated board of directors and observes all necessary corporate formalities.

8. MG Freesites Ltd is a foreign limited liability company organized and operating under the laws of the Republic of Cyprus, having its head office at 195-197 Old Nicosia-Limassol Road, Block 1 Dali Industrial Zone, Cyprus.

9. MG Freesites Ltd is responsible for operating certain websites, referred to as “tubesites,” including “PornHub.”

10. MG Freesites Ltd does not have any offices or employees in the State of South Carolina, or in the United States.

11. MG Freesites Ltd is adequately capitalized, both possessing its own bank accounts and serving as a party to and responsible for fulfilling its own contracts. MG Freesites Ltd also has the equivalent of its own designated board of directors and observes all necessary corporate formalities.

12. MindGeek USA Incorporated is a corporation incorporated under the laws of the State of Delaware, having its principal executive office at 21800 Oxnard Street, Suite 150, Woodland Hills, California 91367 United States of America.

13. MindGeek USA Incorporated’s sole function is to distribute DVD-based content pursuant to the terms of one contract. MindGeek USA Incorporated does not own or operate Pornhub.com and it does not itself create, solicit, post, manage, or have any other involvement with Pornhub.com.

14. MindGeek USA Incorporated is adequately capitalized, both possessing its own bank accounts and serving as a party to and responsible for fulfilling its own contracts. MindGeek USA Incorporated also has its own designated board of directors and observes all necessary corporate formalities.

15. MindGeek USA Incorporated does not have any offices or employees in the State of South Carolina.

16. MG Billing Ltd. is a foreign limited liability company organized and operating under the laws of the Republic of Ireland, having its head office in Dublin, Ireland.

17. MG Billing Ltd.'s function is to assist in the processing of payments for so-called "paysites," that is, websites on which users must pay to access and view adult content. MG Billings Ltd does not own or operate Pornhub.

18. MG Billing Ltd. is adequately capitalized, both possessing its own bank accounts and serving as a party to and responsible for fulfilling its own contracts. MG Billing Ltd also has the equivalent of its own designated board of directors and observes all necessary corporate formalities.

19. To the extent any of the foregoing entities provides services for another, the terms pursuant to which such services are provided are defined by service contracts.

20. MG Freesites II Ltd no longer exists as a company.

21. MG Freesites II Ltd had operated certain tubesites, such as Xtube.com and Youporn.com, but ceased all operations on December 31, 2018 after assigning all of its assets and liabilities to MG Freesites Ltd. MG Freesites II Ltd was subsequently dissolved in 2020.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Date: November 12 2022, located at Nicosia, Cyprus



Andreas Alkiviades Andreou

EXHIBIT Y



Probiller – Online Payment Terms & Conditions

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If you have seen a charge on your credit card that says "Probiller," you may have subscribed to one of our eCommerce partners. If you have questions or concerns, please contact us - we're available 24x7.



Live Chat

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Call Us

+1-855-232-9550

Other countries and numbers



Skype

+1-855-716-6513

Toll-Free Worldwide

Customer Terms and Conditions

Date Last Modified: 10 February 2023

Before Subscriber's transaction can be completed, Subscriber must read and agree to these terms and conditions. By applying for access and/or services from this website, Subscriber is agreeing to these terms and conditions, and is agreeing to be legally bound by them. This agreement is subject to change at any time. Changes are effective when posted on this website without notice upon each subscriber.

Chat

0. Preamble

1. Subscriber data is for internal use only and will be treated confidential.
2. All transactions are SSL encrypted.
3. Subscriber's credit card will be billed immediately after purchase.
4. After purchase Subscriber will receive an email notification with all payment details.
The contract is closed between customer and shop as soon as the order is submitted
5. All orders will be processed immediately.
6. All questions will be answered within two working days.
7. We recommend printing out the transaction data and Terms and Conditions and to keep them at an easily accessible place.
8. Prohibited for people under legal age in their respective country.

1. Definitions

1. **"Member"** or **"Membership"** shall mean the subscriber or user of a valid username and password for the website during the term of membership.
2. **"MG Billing"** or **"Merchant"** shall mean MG Billing Limited, and/or any of the companies billing the Subscriber including any additional billing companies used by MG Billing or changes thereof.
3. **"Site"** shall mean the website for which subscriber is purchasing a username and password in order to access the website and its materials and obtain the benefits of membership.
4. **"Subscriber"** shall mean the user of the services of the Site and holder of a valid username and password for the Site.
5. **"Access rights"** shall mean the combination of unique username and password that is used to access the Site. An access rights is a license to use the Site for a period of time that is specified.

6. **"Bookmarking"** shall mean a URL placed into a temporary file on the subscriber's browser so that the subscriber may return to that page at a future date without having to type in its username and password.

2. Description of Services

MG Billing will provide one access right to access the Site and its materials for which Subscriber is purchasing a membership.

3. Billing

Probiller.com, MGBill, Vendo, Segpay, WTS, or others (depending on Subscriber geographical location) may appear on Subscriber's credit card, bank statement, or phone bill for all applicable charges. If multiple venues are joined utilizing any payment method, Subscriber's statement will list each individual purchase comprising the transaction. MG Billing may include other information on Subscriber statement based on credit card association, telephone regulation, NACHA and any other mandated rules and regulations. If Subscriber elects to use a checking account to purchase a subscription to this Site, a debit will be executed on their checking account.

4. Tax

Value-Added Tax (VAT), Sales Tax or other excise tax may be included in, or added to, your purchase depending on your country, state, territory, city, or on other applicable local regulations. Tax rates may vary accordingly.

5. Payment / Fee

The Site may impose periodic subscription fees at the time of the initial enrolment for subscription. Subscriber is solely responsible for such fees according to the terms and conditions of such Site.

6. Automatic Recurring Billing (If Selected By Subscriber On The Sign-Up Page)

In accordance with the terms and conditions of the Site subscription fees will be automatically renewed at or after the end of the original term selected, unless notice of cancellation is received from the Subscriber. In the event of a failed attempt to charge the Subscriber's payment method (for example, if the payment method has expired or has been declined), MG Billing reserves the right to retry charging the Subscriber's payment method for the amount due or an amount lesser than the amount due, provided that any such attempt to charge a lower amount may be made on a one-time basis, and MG Billing will resume billing the Subscriber for the subscription at the full amount agreed to upon enrollment. MG Billing may suspend or cancel Subscriber's membership if MG Billing is unable to successfully charge a valid payment method. An administration fee of up to \$2.00 may be applied in order to keep a subscription temporarily active until the next attempt to process the recurring payment.

7. Electronic Receipt

Subscribers will receive an email receipt to their email provided upon initial subscription. Subscriber may request a copy of the account of charges of their membership to the Site, but MG Billing does not guarantee the availability of such records more than 365 days after Subscription date. Requests must be

made directly to MG Billing. To contact MG Billing, refer to Customer Support links on the Site, or [click here](#)

8. Agreed upon Method of Communication

MG Billing and the Subscriber agree that a transaction receipt will be provided via email to the Subscriber's address provided at the time of initial enrolment. Subsequent transactional updates may be communicated to the Subscriber through the members' area on the Site (as applicable) upon login to ensure receipt in the event Subscriber has unsubscribed from email communications.

9. Cancellation

At any time, and without cause, subscription to the service may be terminated by either MG Billing or the Subscriber upon notification of the other by electronic or conventional mail, by chat, or by telephone. Subscribers are liable for charges incurred until the date of the termination. Subscribers may cancel at any time by contacting Probiller through the contact information on this page, or online directly with the Site by following the links provided in their transaction receipts.

10. Refunds

Refunds for purchases or recurring charges may be requested by contacting customer support. Refunds or credits will not be issued for partially used Memberships. Cancellation for all future recurring billing may be requested in accordance with Section 9, Cancellation. MG Billing reserves the right to grant a refund or a credit applicable to purchases to the Site at its discretion. The decision to refund a charge does not imply the obligation to issue additional future refunds. Should a refund be issued by MG Billing for any reason, it will be credited solely to the payment method used in the original transaction. MG Billing will not issue refunds by cash, check, or to another payment mechanism.

11. Cardholder Disputes/Chargebacks

All chargebacks are thoroughly investigated and may prevent future purchases with MG Billing given the circumstances. Fraud claims may result in MG Billing contacting Subscriber's issuer to protect Subscriber and prevent future fraudulent charges to Subscriber card.

12. Authorization of Use

Subscribers of the Site are hereby authorized a single access right to access the service or material located on the Site. This access rights shall be granted for sole use to one Subscriber. All memberships are provided for personal use and shall not be used for any commercial purposes or by any other third parties. Commercial use of either the Site or any material found within is strictly prohibited unless explicitly authorized by the Site. No material within the Site may be transferred to any other person or entity, whether commercial or non-commercial. No material within the Site may be distributed through peer-to-peer networks or any other file sharing platforms. In addition, materials may not be modified, or altered. Materials may not be displayed publicly, or used for any rental, sale, or display. Materials shall extend to copyright, trademarks, or other proprietary notices there from. MG Billing reserves the right to terminate this access rights at any time if the terms of this agreement are breached. In the case that the terms are breached, subscriber will be required to immediately destroy any information or material printed, downloaded, or otherwise copied from the Site.

Chat

13. Transfer of Access Rights

Access to the Site is through a combination of a username and a password. Subscribers may not under any circumstances release their access rights to any other person and are required to keep their access rights strictly confidential. MG Billing will not release passwords for any reason, to anyone other than the Subscriber, except as may be specifically required by law or court order. Unauthorized access to the Site is a breach of this Agreement. Subscribers acknowledge that the controller of the Site may track through the use of special software each Subscriber's entry to the Site. If any breach of security, theft or loss of access rights, or unauthorized disclosure of access rights information occurs, Subscriber must immediately notify MG Billing of said security breach. Subscriber will remain liable for unauthorized use of service until MG Billing is notified of the security breach by e-mail or telephone.

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14. Sanction and Approval of Adult Material

For any purchases made on adult-restricted Sites. If Subscriber is under the age of 18 years, or under the age of majority in the location from where access to the Site is attempted, Subscriber does not have authorization or permission to enter or access any of its materials. If Subscriber is over the age of 18 years or over the age of majority in the location from where access to the Site is attempted, Subscriber hereby agrees to comply with these terms and conditions.

For any purchases made on adult-restricted Sites you also understand and agree that, after any purchases, you may be asked to prove or verify your age. If you are unsuccessful (i.e. you are found to be under eighteen (18) years of age or the age of majority in the location where you are attempting to verify from) or unable to do so, your purchase will be cancelled and a refund may be issued to you, in a discretionary manner. Upon such failure to verify or prove your age we also reserve the right, in our sole and final discretion, to prevent you from entering or re-entering the Site by, for example but not limited to, terminating your account.

15. Supplementary Terms and Conditions

The Site may have additional Terms and Conditions that are an integral part of their offering to the Subscriber and are in addition to these Terms and Conditions. Such Terms and Conditions as listed on the Site will in no way invalidate any of the Terms and Conditions listed here. This Agreement shall be construed and enforced in accordance with the laws of the Republic of Cyprus applicable to contracts negotiated, executed, and wholly performed within said country. Disputes arising hereunder shall be settled in the Republic of Cyprus. Transactions are governed by country of merchant of record and use of the membership/websites governed by laws stated in the terms on the website from which the purchase was made.

16. Severability

If any provision of this Agreement shall be held to be invalid or unenforceable for any reason, the remaining provisions shall continue to be valid and enforceable. If a court finds that any of this Agreement is invalid or unenforceable, but that by limiting such provision it would become valid or enforceable, then such provision shall be deemed to be written, construed, and enforced as so limited.

17. Notice

Notices by the Site to subscribers may be given by means of electronic messages through the Site, by a general posting on the Site, or by conventional mail. Notices by subscribers may be given by electronic

messages, conventional mail, telephone, or fax unless otherwise specified in the Agreement. All questions, complaints, or notices regarding the Site must be directed to MG Billing. All cancellations of service to the Site must also be directed to MG Billing.

Questions and Contact Information

All questions to MG Billing regarding these terms and conditions must be directed to:

For billing issues: billing@probiller.com

For support/technical issues: support@probiller.com

For marketing issues: support@probiller.com

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18. Disclaimer

USER UNDERSTANDS THAT THE MERCHANT CANNOT AND DOES NOT GUARANTEE OR WARRANT THAT FILES AVAILABLE FOR DOWNLOADING FROM THE INTERNET WILL BE FREE OF VIRUSES, WORMS, TROJAN HORSES, OR OTHER CODE THAT MAY MANIFEST CONTAMINATING OR DESTRUCTIVE PROPERTIES. USER IS RESPONSIBLE FOR IMPLEMENTING SUFFICIENT PROCEDURES AND CHECKPOINTS TO SATISFY YOUR PARTICULAR REQUIREMENTS FOR ACCURACY OF DATA INPUT AND OUTPUT, AND FOR MAINTAINING A MEANS EXTERNAL TO THE WEBSITE FOR THE RECONSTRUCTION OF ANY LOST DATA. THE MERCHANT DOES NOT ASSUME ANY RESPONSIBILITY OR RISK FOR YOUR USE OF THE INTERNET.

USERS USE OF THE WEBSITE IS AT THEIR OWN RISK. THE CONTENT IS PROVIDED "AS IS" AND WITHOUT WARRANTIES OF ANY KIND, EITHER EXPRESSED OR IMPLIED. THE MERCHANT DISCLAIMS ALL WARRANTIES, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, OR NON-INFRINGEMENT. THE MERCHANT DOES NOT WARRANT THAT THE FUNCTIONS OR CONTENT CONTAINED ON THE WEBSITE WILL BE UNINTERRUPTED OR ERROR-FREE, THAT DEFECTS WILL BE CORRECTED, OR THAT THE WEBSITE OR THE SERVER THAT MAKES IT AVAILABLE ARE FREE OF VIRUSES OR OTHER HARMFUL COMPONENTS. THE MERCHANT DOES NOT WARRANT OR MAKE ANY REPRESENTATION REGARDING USE, OR THE RESULT OF USE, OF THE CONTENT IN TERMS OF ACCURACY, RELIABILITY, OR OTHERWISE. THE CONTENT MAY INCLUDE TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS, AND THE WEBSITE MAY MAKE CHANGES OR IMPROVEMENTS AT ANY TIME. USER, AND NOT MERCHANT, ASSUME THE ENTIRE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION IN THE EVENT OF ANY LOSS OR DAMAGE ARISING FROM THE USE OF THE WEBSITE OR ITS CONTENT. THE MERCHANT MAKES NO WARRANTIES THAT YOUR USE OF THE CONTENT WILL NOT INFRINGE THE RIGHTS OF OTHERS AND ASSUMES NO LIABILITY OR RESPONSIBILITY FOR ERRORS OR OMISSIONS IN SUCH CONTENT. THE MERCHANT DOES NOT WARRANT OR MAKE ANY REPRESENTATIONS REGARDING THE CONTENT'S APPROPRIATENESS OR AUTHORIZATION FOR USE IN ALL COUNTRIES, STATES, PROVINCES, COUNTY, OR ANY OTHER JURISDICTIONS. IF YOU CHOOSE TO ACCESS THE WEBSITE, YOU DO SO ON YOUR OWN INITIATIVE AND RISK AND ARE RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE LAWS.

19. Subscription Fees and User Communication

Subscription and Membership fees to Site are subject to change at any time at the sole and absolute discretion of MG Billing. The official standard membership rates for the Site shall be set forth at the following link: probiller.com. The current monthly membership rate which will appear on Subscriber credit card bill, will be debited from Subscriber account, charged to Subscriber telephone, etc., depending on Subscriber, choice of payment means.

"OPT-IN AND USER COMMUNICATION" – Subscriber's expressly and specifically acknowledges and agrees that his email address or other means of communicating with subscriber may be used to send him offers, information or any other commercially oriented emails or other means of communications. More specifically, some offers may be presented to the subscriber via email campaigns or other means of communications with the option to express the subscriber's preference by either clicking or entering "accept" (alternatively "yes") or "decline" (alternatively "no"). By selecting or clicking the "accept" or "yes", the subscriber indicates that the subscriber "OPTS-IN" to that offer and thereby agrees and assents that the subscriber's personal information, including its email address and data may be used for that matter or disclosed to third-parties."

"OPT-OUT AND USER COMMUNICATION" – Subscriber's expressly and specifically acknowledges and agrees that his email address or other means of communicating with subscriber may be used to send him offers, information or any other commercially oriented emails or other means of communication. More specifically, other offers may be presented to the subscriber via email campaigns or other means of communications with a pre-selected preference or choice. If the subscriber does not deselect the pre-selected preference of choice (i.e., "OPT-OUT" of the offer) then the Site may transfer the subscriber's personal profile information to the third-party service or content provider making the offer. If the subscriber deselects the pre-selected preference, then no personal information about the subscriber may be disclosed to any third-party service or content provider.

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About Us

Payment Solutions

Payment Security

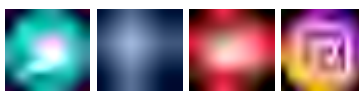
FAQ

Contact Us

Contact Us

+1-855-232-9550

Other countries and numbers



[Privacy Policy](#) [Terms and Conditions](#)

Appx000717



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MG Billing US Corp, 21800 Oxnard St. Ste 150, Woodland Hills, CA, 91367-7909 USA

MG Billing Limited, 195-197 Old Nicosia-Limassol Road, Dali Industrial Zone 2540, Block 1, Cyprus

EXHIBIT Z



HOME

ABOUT
ME

OPEN SOURCE
SURVEILLANCE

KAMERKA.IO

SIGN
UP

ACCOUNT

SIGN
IN

PATREON

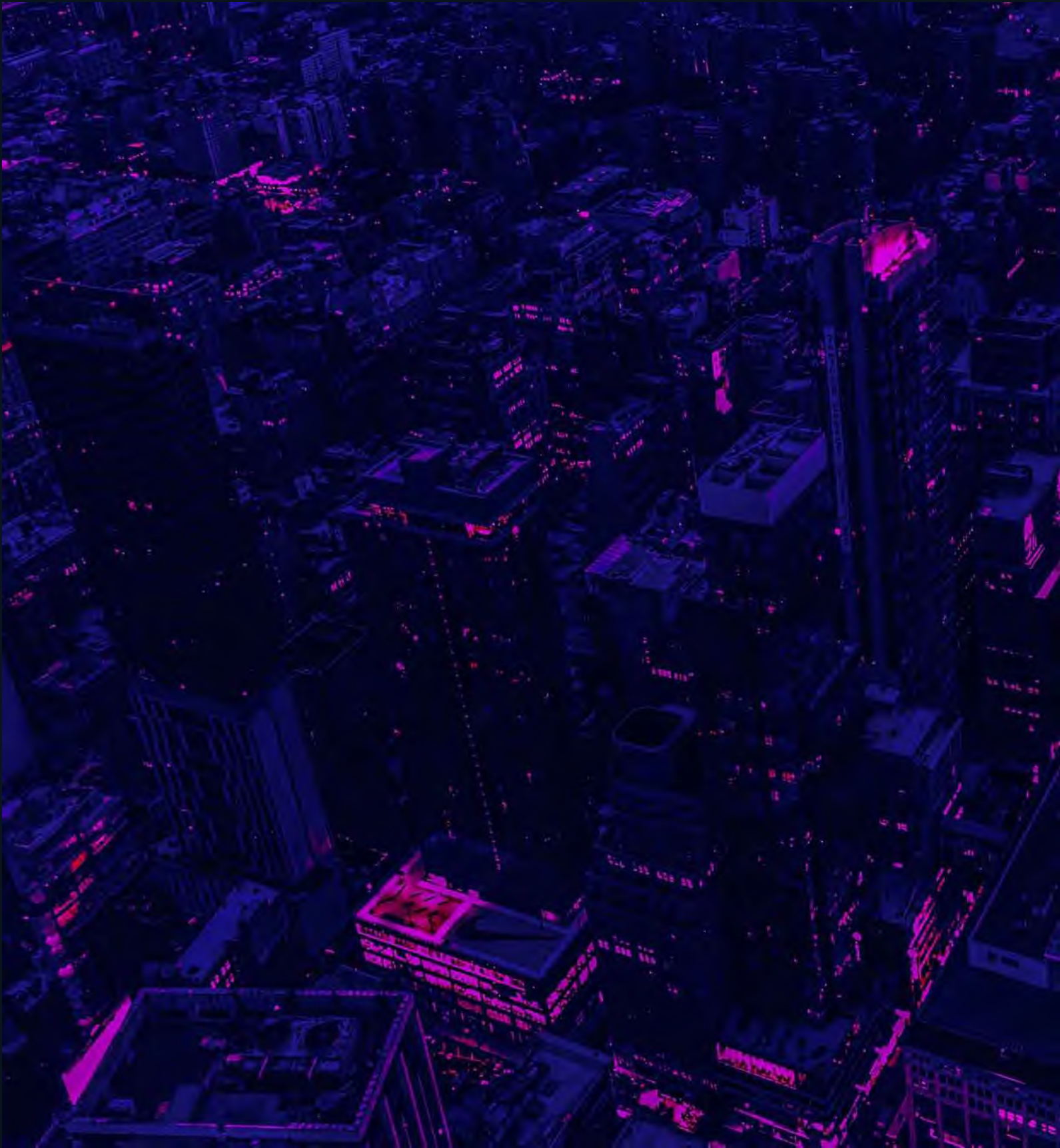
Offensive OSINT s01e05 - OSINT & Corporate espionage. Tentacles of Mindgeek part 1.



WOJCIECH

20 MAY 2020

• 24 MIN READ



In this episode we will take a look on corporate structure of **Mindgeek** - leading company in content delivery, SEO, advertisement, hosting and general tech innovation. They operate worldwide and websites owned by them generate hundreds of millions visits per day and more bandwidth than Twitter, Amazon, or Facebook. **Maybe you don't know this company but I bet they know you.**


Appx000720

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Offensive OSINT s01e04 - Intelligence gathering on critical infrastructure in Southeast Asia

This is the second part of my investigation into

Offensive OSINT • • Wojciech



Note

***Mindgeek** operates in adult entertainment field so if you are not comfortable reading about porn industry, leave the site.*

*Article does not mean to proof any wrongdoing of **Mindgeek**, I choose this company as an example due to distributed corporate structure and interesting strategy to expend their business.*

*I am not associated in any way with **Mindgeek**.*

Short story of MG

The whole story began in 2003 when group consisting of **Ouissam Youssef**, **Stephane Manos**, **Matt Keezer** and two other persons founded company dubbed **Mansef**. They operated affiliate networks and as a holding company for TGP (thumbnail gallery post) websites. After many successes in porn industry they started to grow and created brands like **Pornhub** in 2007 or **Brazzers** couple years before. Story gets it's tempo in 2009 when Secret Service seized more than \$6 milion from **Mansef** due to money laundering accusations.

In the meantime, German citizen **Fabian Thylmann**, who invented **NATS** (Next-Generation Affiliate Tracking Software) used in affiliate networks, was acquiring brands like **MyDirtyHobby**, **Webcams** or **Xtube**.

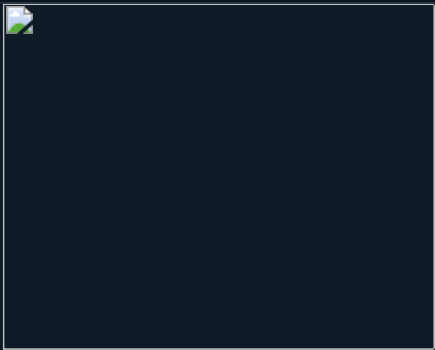
After episode with Secret Service, **Stephane Manos** and group sold **Mansef** to **Fabian Thylmann** and now they run **Valnet Inc.** and **Valsef Capital** online media (not porn related).

Thylmann changed company name to **Manwin** and build a porn empire in next couple years. For example in 2009 his website "**My dirty Hobby**" was earning up to 3 millions euro per month. Besides obvious income methods like paid content, **Manwin** was selling his traffic and had annual sales of nearly half a billion dollars and a profit of almost \$170 million. The story also contain many mysteries and one of them might be loan he got from secret donors for \$362 millions. At the top, **Manwin** had under control following brands: **Playboy TV**, **Digital Playground**, **Twistys**, **YouPorn**, **Redtube**, or **Gaytube** among others. History known from **Mansef** repeats also for **Manwin**, in December 2012 **Fabian Thylmann** was extradited to Germany due to tax evasion suspicions. "**My Dirty Hobby**" was associated with Cyprus company "**Colbette Holding Limited**", which handled international payment processing but money didn't go through **Manwin's** German HQ. Also Bahamas company "**Carsed Marketing**" (not active anymore) related to **Twistys**, took it's part in tax evasion process. Searching the company name in Offshore Leaks Database, you can find that it's intermediary of "**Valdy Administration (Bahamas) LTD**". Same as 550 other companies.

CARSED MARKETING INC. | ICIJ Offshore Leaks Database

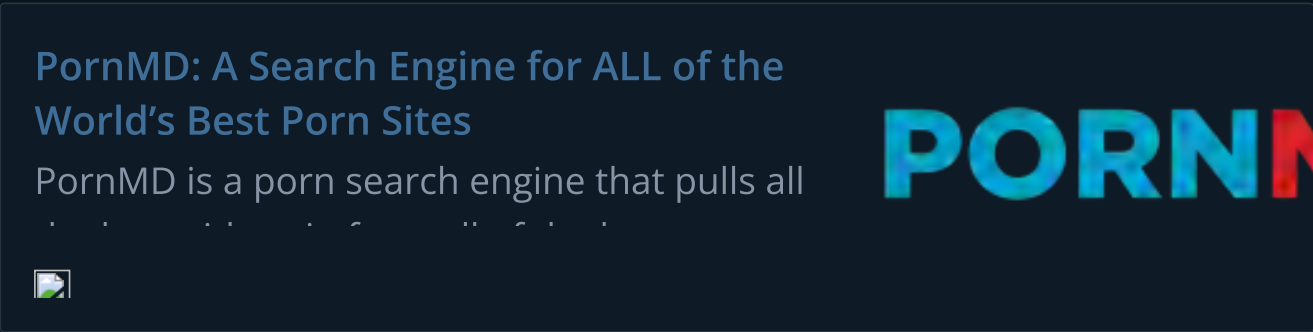
Bahamas Leaks Entity: CARSED MARKETING

Home •



All charges have been dropped after he paid 5 millions euro, however, in 2013, he sold [Case 2:23-cv-00552-BSJ Document 19-3 Filed 09/13/23 PageID.1353 Page 532 of 549](#) **Manwin** for \$100 millions to **Feras Antoon** and **David Tassilo**. They run the company for this day only changed name to **Mindgeek**.

From couple years **Mindgeek** is in buying-spree and extends it's business as much as possible. These are only the popular brands owned by them:

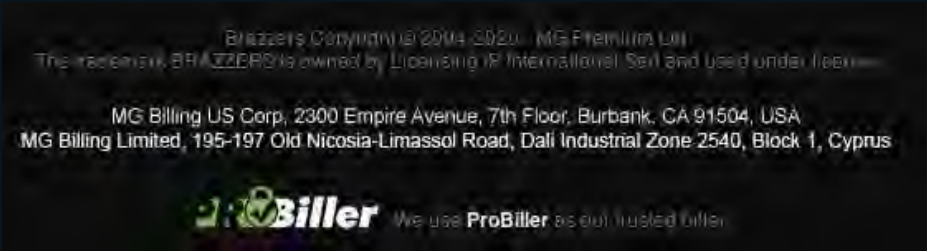


Adult search engine powered by Mindgeek

You can recognize if site is owned by **Mindgeek** by looking at terms & privacy

The Websites are operated by MG Freesites Ltd, Block 1, 195-197 Old Nicosia-Limassol Road, Dali Industrial zone, Cyprus 2540. All notices of copyright infringement claims should be sent to the copyright agent designated in our Copyright Policy at <https://www.pornhubpremium.com/information#dmca>, <https://www.modelhub.com/information#dmca>, <https://www.pornhub.com/information#dmca> in the manner and by the means set forth therein.

or footer of the site



but they are also engages in different areas of the Internet. First, they own company "**Traffic Junky**" that sells traffic and serves 3.9 billion daily ad impressions. Second, they push Age-ID which is secure solution to get access to age-restricted websites. Third, they build games, mobile applications and provide VPN access. What is all this for? I hope I will give some answers in next chapters.

Corporate structure of Mindgeek

After this short and probably boring but necessary introduction we already know a bit about history of the company. Before each corporate related investigation, first take a look on a big picture, track roots and important changes in organization. Thanks to this, you won't be

MindGeek operates under a complex structure of multiple companies in countries such as the British Virgin Islands, Canada, Curaçao, Cyprus, Germany, Ireland, Luxembourg, Mauritius, the Netherlands, the United Kingdom, and the United States. Its structure has been described as mostly a way to avoid corporate tax by a de facto Canadian company; with billing companies in Ireland, subsidiaries in Curaçao and holding ones in Cyprus and Luxembourg, all countries that have been identified as tax havens or having lax tax regulations. Canada also has special tax treaties with Luxembourg, the legal headquarters of MindGeek, where a Canadian subsidiary is exempt from taxes paid on royalties to its Luxembourg parent.

Sounds like a perfect example to practice OSINT skills and find all of these companies, their use and people engaged.

Two best sources, in my opinion, for tracking corporate structure are

OpenCorporates

<https://opencorporates.com/>

and Corporation Wiki

Corporation Wiki - Find Connections between People and Companies

The future of corporate history. Discover more

Corporation Wiki •

The second one offers simple network visualization, which is quite cool when you have couple assets and want to see everything in clear way.



However OpenCorporates has something that Corporation Wiki does not and it made my work so much easier. The thing I'm talking about is a **corporate grouping**. Users can contribute to any company and add details like subsidiary, branch, alternate names or information about officers. Thanks to this I didn't have to search for each organization owned by Mindgeek but instead corporate grouping in OpenCorporates shows 172 companies managed by Mindgeek.

https://opencorporates.com/corporate_groupings/MindGeek/companies?page=1

It includes every necessary detail to support the investigation - **Jurisdiction, Registered Address, Officers, Incorporation Date** or **Status**. It also links to the official government documents about company what gives even more leads to follow.

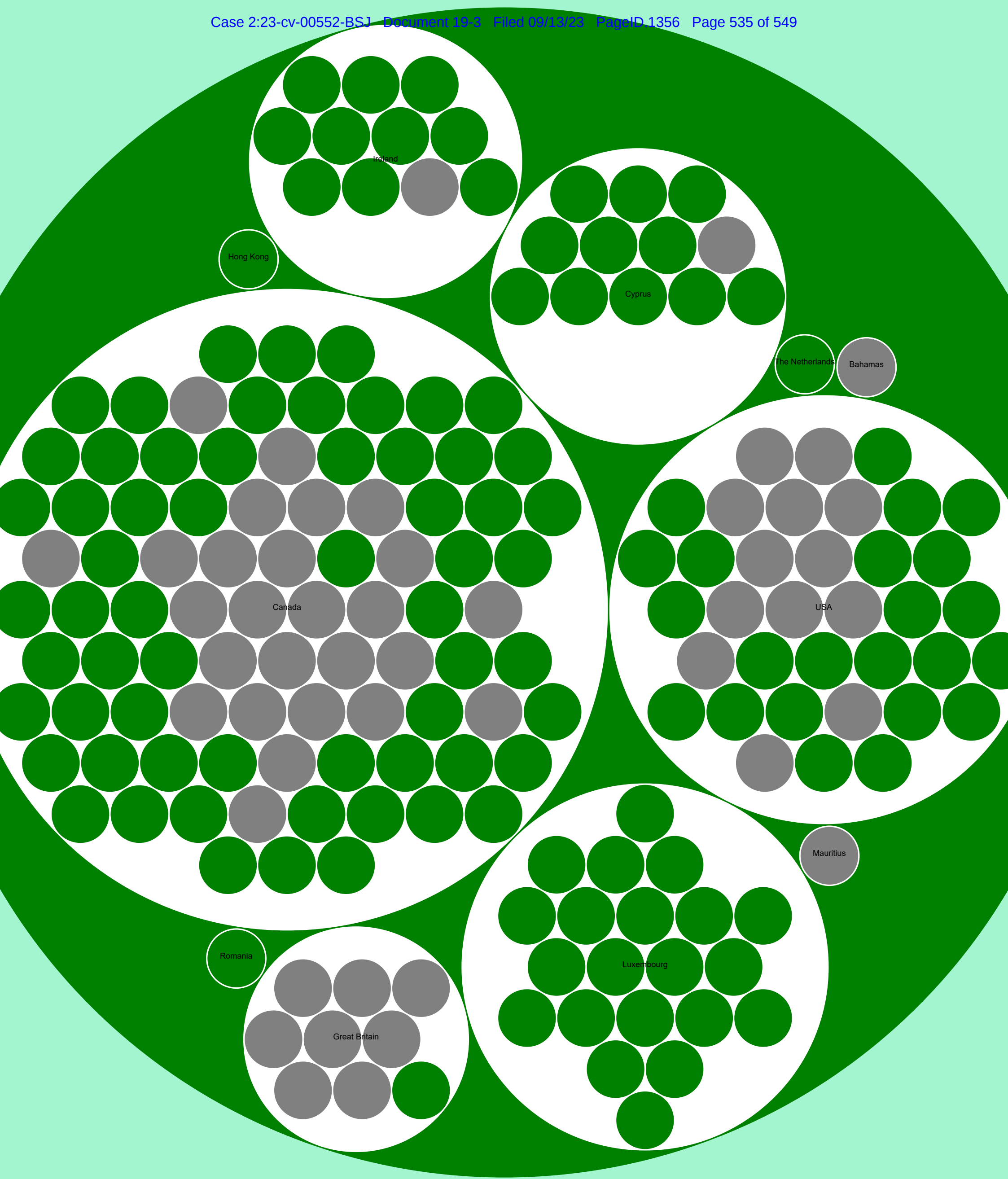
They also provides free API access up to 100 requests. You can easily access MG corporate grouping with endpoint

which gives details about every company associated with Mindgeek. We will categorize it by country, so we need to take couple things into account, what jurisdiction it operates under and if company is active.

Above code makes a request to the corporate grouping of Mindgeek, iterates over the records and prints names and jurisdiction code. I already created two dictionaries because I knew the format for d3 JS visualization. To show it's scale and distributed nature I decided to use circle packing visualization, where each bubble mean company and biggest circles are countries.

I had to tweak the JavaScript a little bit so it could support my idea to differentiate inactive companies. I also added two additional keys to default json file - **"main"** and **"inactive"** and adjusted one line to fill it in with different color.

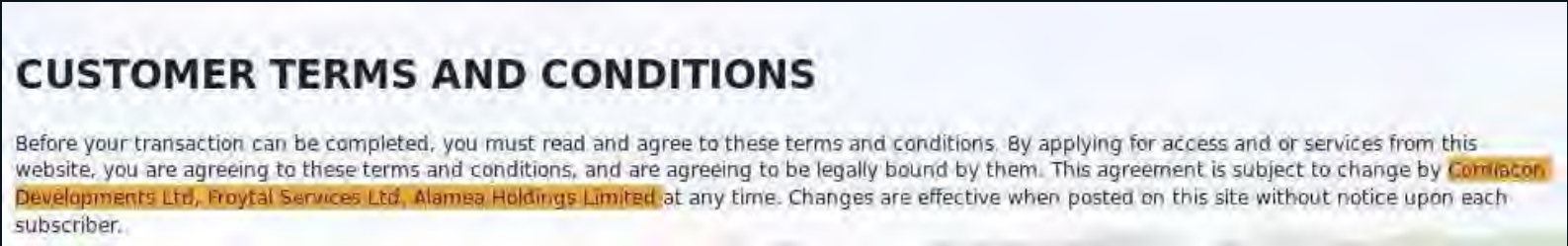
Basically, it means that if company is inactive then make it grey. Parameter "**main**" is used to make "country bubbles" white and rest of the companies, i.e. active ones are green.



Now it's much more visible and we can clearly see where it operates and how many companies are located in specific country. OpenCorporates still links to the legacy **Manwin/Mansef** companies in Mauritius or Bahamas but they are already inactive and do not count as a valid **Mindgeek** assets.

I chose to sort it by country to show you scale of the business. There are many companies that are responsible for different things like websites, payments, intellectual property, studios or games. I spent lot of time to sort these organizations by their use, i.e. why this particular company exist and what tasks it performs.

I want to highlight, that is' not an easy task to do. **Mindgeek** has very distributed corporate structure with many companies/officers and with alternate names for lots of their organizations. For example terms and conditions on **Bang U TV** or **Mofos TV** state that site is operated by **Cordiacon Developments Ltd, Froytal Services Ltd, and Alamea Holdings Limited**.



<http://www.bangutv.com/terms>

Cordiacon Developments Ltd is a company that has been dissolved in 2015.

<https://opencorporates.com/companies/gb/06858633>

Alamea Holdings Limited now is known by the name **MG BILLING CY**

<https://opencorporates.com/companies/cy/HE267496>

Froytal Services Ltd is an alternate name for Canadian company **MG PREMIUM LTD**

https://opencorporates.com/companies/ca_qc/1167412353

In addition the last one was suspected of money laundering in 2012

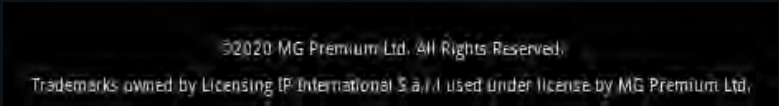


<https://www.businesswire.com/news/home/20121029006670/en/AHF%E2%80%99s-FEC-Complaint-Charges-Porn-Campaign-Foreign>

So, I sorted it according their use and I will present example sources that confirm my assumptions.

Websites

The first obvious things to check for ownership of the website is to look into Privacy Policy or Terms and Conditions. For example footer on babes.com shows that site is managed by **MG PREMIUM LTD**.



Quick Google dork "**©2020 MG Premium Ltd. All Rights Reserved.**" will reveal all websites operated by this organization. However, it's not always possible since MG add image to footer instead of a text.

Copyright related papers must disclose full names of the all providers to get actual notifications about infringements. From there we can add another companies and websites operated by MG.

SCHEDULE "A"

AMENDED INTERIM DESIGNATION OF AGENT TO RECEIVE NOTIFICATION OF CLAIMED INFRINGEMENT

MG Freesites Ltd

Section 1 Alternative Name(s) of Service Provider (including all names under which the service provider is doing business):

pornhub.com
pornhubpremium.com
pornhubselect.com
thumbzilla.com
tube8.com
tube8.es
tube8.fr

Section 2 Email Address of Designated Agent:

<u>Website</u>	<u>Email Address of Designated Agent</u>
pornhub.com	copyright@pornhub.com
pornhubpremium.com	copyright@pornhub.com
pornhubselect.com	copyright@pornhub.com
thumbzilla.com	copyright@thumbzilla.com
tube8.com	copyright@tube8.com
tube8.es	copyright@tube8.com
tube8.fr	copyright@tube8.com

https://cdn.loc.gov/copyright/onlinesp/agents/m/mg_freesites_ltd_amd.pdf

Amended Interim Designation of Agent to Receive Notification of Claimed Infringement

Full Legal Name of Service Provider: Webnovas Technologies Inc

Alternative Name(s) of Service Provider (including all names under which the service provider is doing business): XTube, XTube.com, XTubePaidChannels.com

Address of Service Provider: 405-10 Milner Business Court, Toronto, ON, M1B3C6

Name of Agent Designated to Receive Notification of Claimed Infringement: Lance Cassidy

Full Address of Designated Agent to which Notification Should be Sent (a P.O. Box or similar designation is not acceptable except where it is the only address that can be used in the geographic location): 405-10 Milner Business Court, Toronto, ON, M1B3C6

Telephone Number of Designated Agent: 416-321-0588

Facsimile Number of Designated Agent: 416-913-1212

<https://cdn.loc.gov/copyright/onlinesp/agents/w/wenotgies.pdf>

These methods allowed me to narrow companies that are responsible for operating different websites:

- CORDIACON DEVELOPMENTS LTD
- MG FREESITES LTD
- MG PREMIUM LTD
- MG FREESITES II LTD
- MG TECHNOLOGIES LTD
- Webnovas Technologies Inc.
- MG Mainstream S.a.r.l.
- MG Technologies S.a.r.l.


- MG Premium S.a.r.l.
- MG Freesites S.a.r.l.
- MG Luxembourg S.a.r.l
- MG Reality S.a.r.l.
- MG Media S.a.r.l.
- MG GLOBAL ENTERTAINMENT INC.
- PREMIUM HUB INC.
- MG MAINSTREAM LTD
- Midstream Media International N.V.

Studios/Brands

These subcategory was simple, there are many popular brands owned by MG and googling name of the company gives you even wikipedia page about the brand or studio. Unfortunately, not every company has it's own website and is not recognizable worldwide. In this case we can use Linkedin and look for organization details. Even when company has no description, people disclose many information via their experience.

Based on the experience from one of the former employee of MG and current employee of Reimsberg Developments Inc we can conclude that it's a film studio.


Experience



Colorist

Reimsberg Developments Inc.

- Make sure that all shots in each scene match one another.
- Balancing color saturation and luminance from shot to shot.
- Correct color differences and ensure consistency throughout the production.



MindGeek

- Responsible for keeping pictures up to date on websites, while maintaining the quality level to its maximum.
- Retouching, preparing, and editing pictures in Photoshop.
- Ensure delivery of high-quality content while working as a strong team with co-work ...[see more](#)

Based on Google and Linkedin I separated following studios and brands:

- CLUB JENNA, INC
- DOLCE AMORE, INC.
- [SPICETV.COM](#), INC.
- DIGITAL PLAYGROUND, INC.
- REALITY KINGS, LLC
- BRAZZERS TECHNOLOGIES INC.
- Reimsberg Developments Inc.
- Playboy Plus Entertainment, Inc.
- Playboy TV/UK Benelux Limited
- CODY MEDIA, INC.


Intellectual Property

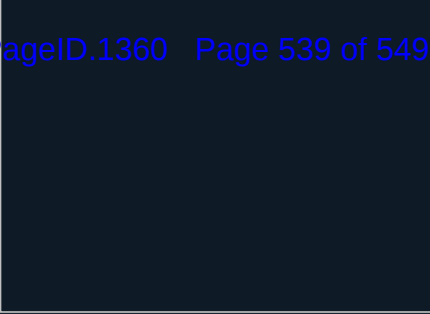
Thanks to registered trademarks, we can connect one or more companies to each other. [Trademarkia.com](#) is a must have source during this types of investigations.



Apply for a Trademark. Search for a Trademark

Trademarkia is the largest trademark search engine in the world. It's free to use and it's easy to use.


 trademarkia •




It also gives insight view of the new campaigns that company is currently engaged in. Let's take a look on **Licensing IP International S.a.r.l.**

Licensing IP International S.a.r.l. Trademarks (14) from Trademarkia - page 1

Page 1 of the latest trademarks from Licensing IP International S.a.r.l. on Trademarkia

 trademarkia •



They own trademarks for popular brands like **"StayHomeHub"**, **"VPN hub"**, **"Pornhub Awards"**, **"Redtube"** and **"Clippy The Bear"**. The last one has been registered last month and it looks like **Mindgeek** will try to release new product.

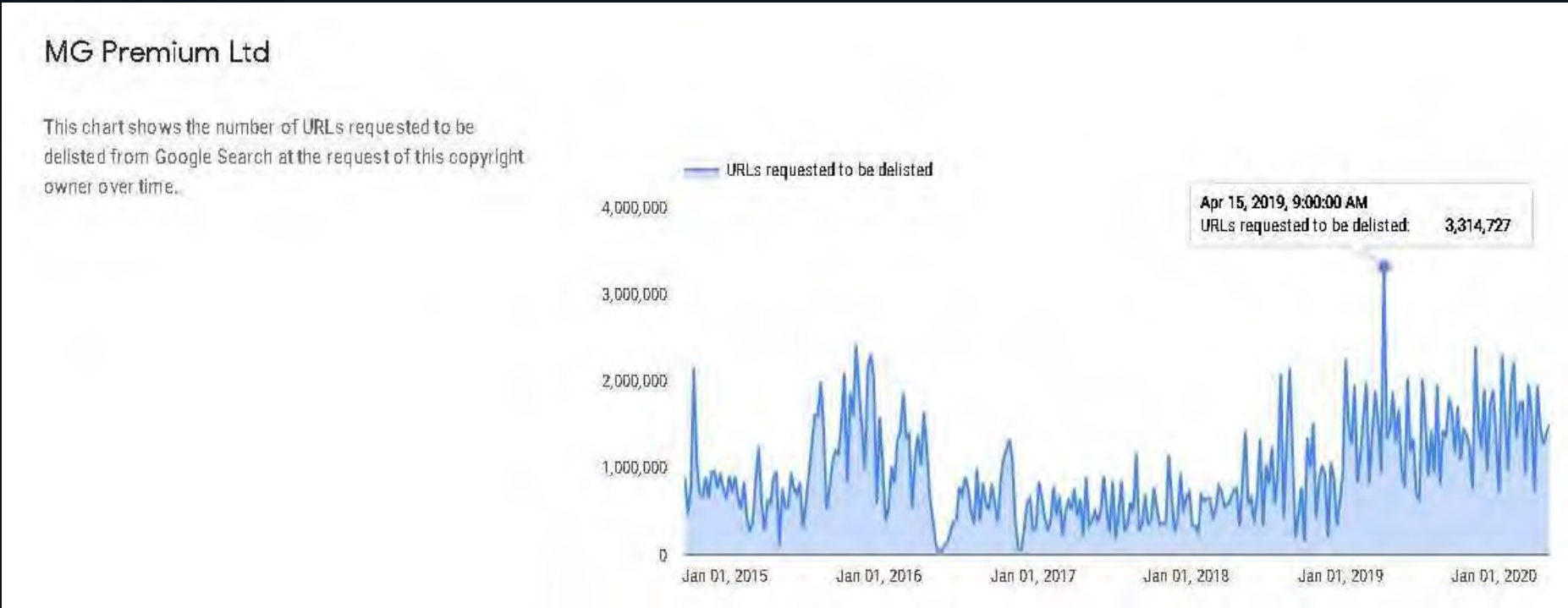
FC

DOWNLOADABLE COMPUTER CHATBOT SOFTWARE FOR SIMULATING CONVERSATION;

FC

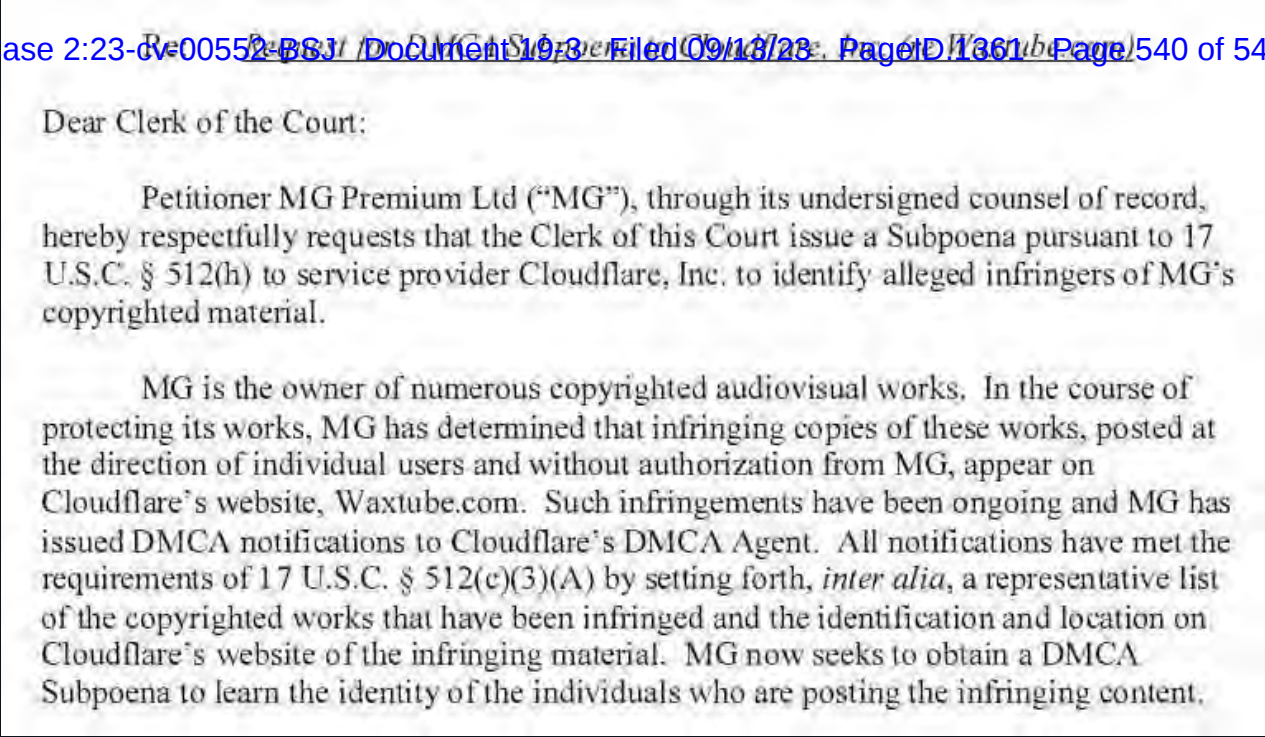
DOWNLOADABLE COMPUTER SOFTWARE FOR REPLYING TO QUESTIONS FROM ONLINE RETAIL STORE CUSTOMERS RELATED TO THE SUBJECT OF ADULT ENTERTAINMENT

Second useful source related to intellectual property is **Google Transparency Records**. It shows what company asks Google to take down urls due to copyright infringement. The reports show that **MG PREMIUM LTD** is responsible for reporting these url and for example, on 11th of May they requested almost 1.5 millions url to be delisted. Full chart is accessible below




<https://transparencyreport.google.com/copyright/owners/70158>

Because of high volume of infringements, they decide to go after people that upload the videos. They are taking case to the court to identify individuals and "asks" **Cloudflare** to help.



Mindgeek has a specific relationships to copyright infringements on their own tube sites. The quote from National Post article explains it pretty well.



Even content producers that MindGeek owns have trouble getting their movies off MindGeek’s tube sites. The result has been a vampiric ecosystem: MindGeek’s producers make porn films mostly for the sake of being uploaded on to MindGeek’s free tube sites, with lower returns for the producers but higher returns for MindGeek, which makes money off of the tube ads that does not go to anyone involved in the production side. <https://nationalpost.com/news/how-a-canadian-founded-company-youve-never-heard-of-took-control-of-the-porn-industry>

Clever, right?

I identified following companies responsible for intellectual property things

- MG IP S.a.r.l.
- MG IP II S.a.r.l.
- MG Licensing Europe S.a.r.l.
- Licensing IP International S.a.r.l.
- MG PREMIUM LTD

Advertisement/Affiliate programs

MG covers most trafficked areas of the Internet so it's obvious move to sell the traffic that these websites have generated. I had no problems in establishing which companies are used for advertising, **Traffic Junky** is widely known and **WebExpansion Inc** and **ExpansionWeb Inc** are a legacy companies. One additional company - **6721851 CANADA INC**, was used at the beginning to promote whole idea about internet advertising/marketing and monetize the clicks. It was known by many different alternative names.

6721851 CANADA INC. <div>BRANCH</div>	
Company Number	1164278716
Status	Radiée D'office Suite à Une Fusion
Incorporation Date	2 March 2007 (about 13 years ago)
Company Type	Société par actions ou compagnie
Jurisdiction	Quebec (Canada)
Branch	Branch of 6721851 CANADA INC. (Canada)
Registered Address	2469 RUE Pilote Laval Québec H7T0E7 Canada Canada
Industry Codes	7797: (Québec Economic Activity Classification) 7741: (Québec Economic Activity Classification)
Governing Legislation	CANADA: Loi canadienne sur les sociétés par actions, L.R.C. (1985), c. C-44
Alternative Names	BTN TRAFFIC (trading name, 2007-03-02 - 2008-11-12) CLIC-GAUCHE (trading name, 2008-07-08 - 2008-11-12) INTERHUB (trading name, 2008-05-21 - 2015-05-15) LEFTCLICK (trading name, 2008-07-08 - 2008-11-12) MANSEF TRAFFIC (trading name, 2007-03-02 - 2015-05-15) TRAFFICJUNKY (trading name, 2008-07-08 - 2008-11-12) TROMPEURS DE TRAFIC (trading name, 2008-07-08 - 2008-11-12)
Inactive Directors / Officers	MANOS, STEPHANE, secrétaire SAID, SALAM, trésorier YOUSSEF, HASSAN, administrateur YOUSSEF, OUISSAM, président

Beside [trafficjunky.com](#), they also operate for example [adultforce.com](#).

I found following advertising companies:

- trafficjunky inc.
- WebExpansion Inc.
- EXPANSIONWEB INC.
- 6721851 CANADA INC.

Games/Applications

Adult entertainment it's not only videos and pictures, **Mindgeek** owns **NUTAKU ENTERTAINMENT LTD** known as the 'steamy steam'. It's a steam like platform for adult gaming with millions of users. The gaming platform proofs that **MG** extends their activity to every possible field to give users maximum experience. **Nutaku** is a known brand operating from 2014 but **MG** manages other companies that develops mobile apps but they are not related to adult entertainment industry.

Mirmay Limited (https://play.google.com/store/apps/dev?id=7557161041199736267&hl=en_GB) developed:

- **Downloader & Private Browser - Kode Browser** - 1.3 mln downloads
- **Private Downloader** - 25k downloads

AppAtomic Limited (https://play.google.com/store/apps/details?id=com.appatomic.vpnhub&hl=en_GB) developed:

- **VPNhub Best Free Unlimited VPN - Secure WiFi Proxy** - 166k downloads

Liquidum Limited (https://play.google.com/store/apps/dev?id=5055253408139725132&hl=en_GB) developed:

- **Rocket VPN – Internet Freedom** - 65k downloads

Two additional companies engaged in mobile apps are:

- **SUPER HIPPO STUDIOS LIMITED** (known from erotic RPG "**Sacred Sword Princesses**")
- **NUTAKU PUBLISHING LIMITED**

Payments

The last category that ensures money flow are payment related organizations. Processing big amount of customer's payments requires separate companies and authorized agents as well as organized client support service.

MG Billing, Probiller.com, MGBill, Vendo, Segpay, WTS, EPOCH, or others (depending on your geographical location) may appear on your credit card, bank statement, or phone bill for all applicable charges. If multiple websites are joined utilizing any Payment Method, your statement will list each individual purchase comprising the transaction. MG Billing may include other information on your statement based on requirements of credit card association, telephone regulation, National Automated Clearinghouse Association or any other mandated rules and regulations. If you elect to use a checking account to purchase a subscription to Pornhub Premium, a debit will be executed on your checking account.

<https://www.pornhub.com/information#terms>

Probiller.com is a company directly owned by **Mindgeek** and others are authorized agent. All of them support almost every type of payment and currency - Skrill, Paysafe Card, Paypal or Bitcoin.

Following companies are associated with payments

- MG BILLING CY LTD
- PRO BILLER INC.
- COLBETTE HOLDINGS LIMITED
- MG PROCESSING II CORP.
- MG BILLING LIMITED
- MG BILLING US CORP.

Most of the companies are located in Cyprus or Luxembourg.

Other

There are plenty other companies that have no online records so it's hard to categorize it in any way, however I still haven't exhausted sources that I want to show you, so take a look on some uncategorized companies.

Court cases are trove of information to get insight what company is up to. **Bright Imperial Ltd.** sued another porn company **RT MEDIASOLUTIONS, S.R.O.** for trademark exploitation. Defendant owned websites [red-tube.com](#) which is an infringement of [redtube.com](#) owned by **Bright Imperial Ltd.** at that time.

Bright Imperial Ltd. v. RT MediaSolutions,
S.R.O., Civil Action No.: 1:11-cv-935-LO-TRJ
| Casetext Search + Citator

Read Bright Imperial Ltd. v. RT MediaSolutions, 2020 FC 1111, 2020 FC 1111

Legal research tools from Casetext •

- Liam O'Grady

Another way to collect information about organization activities are patents they use or were sued over. Case **Joao Control & Monitoring Systems, LLC et al. v. Johnsbury LTD.** shows all defendants i.e. every organization engaged in alleged infringement.

Plaintiff(s)	Defendant(s)
Joao Control & Monitoring Systems, LLC	Johnsburg LTD.
	Manwin
	Manwin Holding SARL
	D.P., Inc.
	Manwin D.P. Corp.
	Digital Playground
	Manwin Billing CY LTD.
	Manwin Billing Ireland, LTD.
	Manwin Billing US Corp.
	Manwin Billing MU LTD.
	Manwin Licensing International SARL
	Manwin Canada
	Eurorevenue

<https://portal.unifiedpatents.com/litigation/New%20York%20Southern%20District%20Court/case/1:12-cv-06781>


and of course patent that whole case is about. The patent is about video recording and being precise

US6587046B2

A monitoring apparatus and method including a processing device for receiving video information recorded by a video recording device or a camera, wherein the video recording device or a camera is located at a vehicle or a premises and the processing device is located at a location remote from the vehicle or premises.

US6587046B2 - Monitoring apparatus and method - Google Patents

A monitoring apparatus and method including



Wikiwand is an extremely useful source that I found out lately. You can view edits and talk about any Wikipedia page. Users shares their own researches and proofs to make the page even more reliable. There are many archived information that I wasn't able to find somewhere else and it dispelled my doubts in many cases.

Wikiwand

Wikiwand is the world's leading Wikipedia



On the technical side, they are registered by the same registrar through which all other MindGeek websites have been registered, EuroDNS S.A. (check any website via WHOIS). Hosted on the same ISP as well, Reflected Networks Inc. (check the host of any MindGeek website). Content such as JS and other elements are served by phncdn.com (PornHub CDN).

<https://www.wikiwand.com/en/Talk:MindGeek>

Other companies with unknown use

You can follow the lead and investigate some of them on your own.


- RK NETMEDIA, INC.
- MANWIN/RK COLLATERAL TRUST
- Midstream Media International N.V.
- MG Germany GmbH - Germany HQ
- MG HOSTING LIMITED
- Colbette II Limited
- MindGeek RK S.a.r.l.
- STATSnet Nightlife S.a.r.l.

- DONORMASS LTD
- Case 2:23-cv-00552-BSJ Document 19-3 Filed 09/13/23 PageID.1365 Page 544 of 549
- GONETMARKET INC.
- CYGEST TRADING LTD
- STATSnet Holding S.a.r.l.
- MG JVP S.a.r.l.
- DMMG S.a.r.l.
- CSMG LTD
- BRIGHT IMPERIAL LIMITED - Redtube
- MG SOCIAL LTD - AgeID

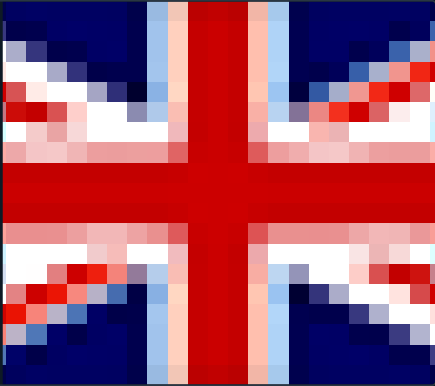
AgeID | Your Access to the World of Age-Restricted Websites

Get your online age verification with AgeID.

... ..



Your Access to the World of Age-Restricted W...



So we already know the company structure, what they do and where they are located. Only one thing left - to meet the people behind this infrastructure.

Officers

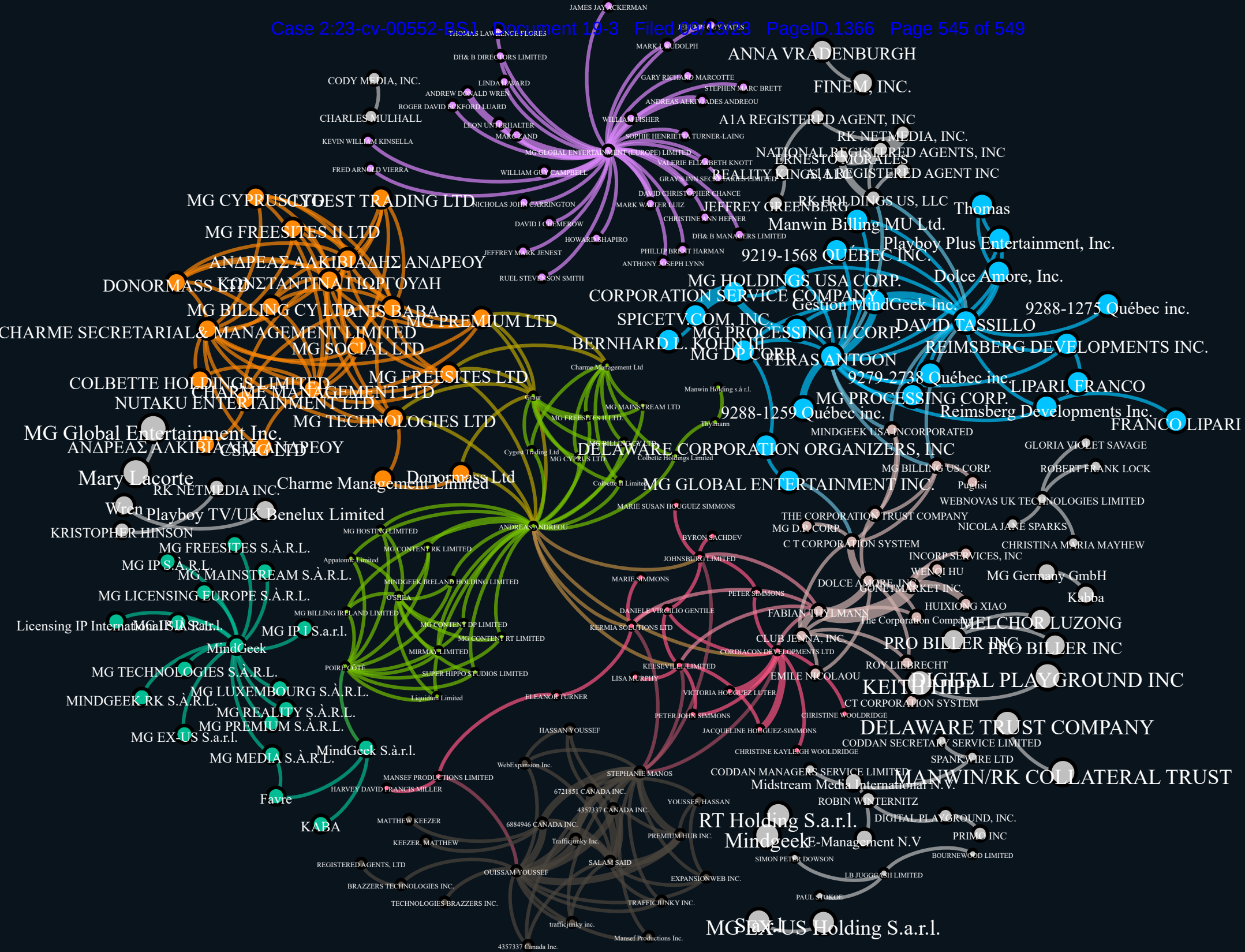
You should already know major figures that managed whole business - **Stephane Manos**, **Ouissam Yousef**, **Fabian Thylmann**, these people currently are not actively involved in the company. Nowadays, people behind the wheel are: **Feras Antoon** and **David Marmorstein Tassillo** (according Wikipedia). We have already our corporate grouping ready and OpenCorporates also shows officers associated with the company making visualization much easier.

```
req = requests.get("https://api.opencorporates.com/v0.4/corporate_groupings/mindgeek")
req_json = json.loads(req.content)

for i in enumerate(req_json['results']['corporate_grouping']['memberships']):
    req2 = requests.get("https://api.opencorporates.com/v0.4/companies/"+i['membership']
['company']['jurisdiction_code']+ "/" +i['membership']['company']['company_number'])
    req2_json = json.loads(req2.content)
    for i in req2_json['results']['company']['officers']:
        try:
            print(req2_json['results']['company']['name'] + ";" +i['officer']['name'])
        except Exception as e:
            print(e)
```

Above code is similar to the previous one, I just added additional request to check for officers in each company from corporate Mindgeek groupings. At the end you will have a big csv like output semicolon seperated officer and name of the company. In some cases there are more than one officer for organization which gives more relationships and possible connections.

After that, we can import file to the Gephi and tune our chart. I used Force Atlas 2 with stronger gravity and scaling around 20. Nodes are size ranked by modularity.

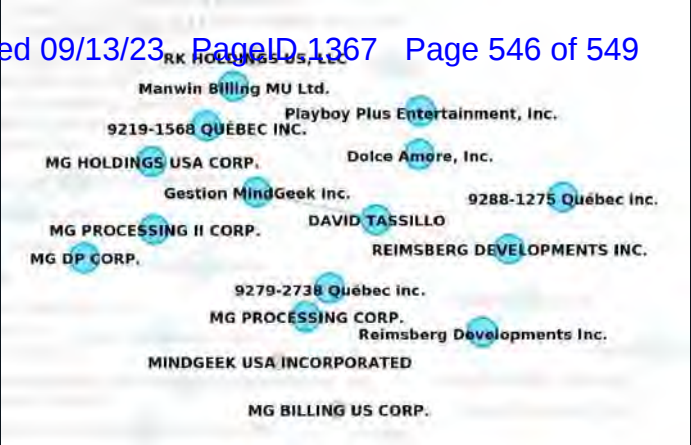


Follow me on twitter

This visualization is crystal clear, I didn't know that it will be so readable. It's separated into couple parts, mostly by country or officer. So, at the bottom of the chart (brown-ish color) you see legacy **Mansef** companies owned by **Stephane Manos** and **Ouissam Youssef**




On the right (blue color) companies owned by **Feras Antoon** and **David Marmorstein Tassillo** are highlighted.



but, of course, there are more than that, companies in different countries have completely other structure. Couple of persons seem to have a lot of organizations under their names, especially in Cyprus with connection to Great Britain.

- **ANDREAS ALKIVIADES ANDREOU** (ΑΝΔΡΕΑΣ ΑΛΚΙΒΙΑΔΗΣ ΑΝΔΡΕΟΥ)
- **ANDREAS ANDREOU** (ΑΝΔΡΕΑΣ ΑΝΔΡΕΟΥ).

I mentioned earlier about difficulties with identifying companies based on their names and alternates names. It's similar with people, it turns out that **Andreas Andreou** is super popular name in Cyprus and these are two different people. From **Mindgeek** Linkedin page, we can learn that first of them is a Director for 10+ year and second works for almost 5 years.



Director of Corporate Finance and Accounting and Board Member

MindGeek

Nov 2009 – Present · 10 yrs 7 mos

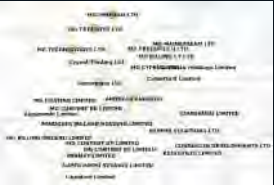
Nicosia, Cyprus

On each official statement, only **ANDREAS ANDREOU** is signed as a director.

Liste des administrateurs	
<div>Masquer l'historique</div>	
Nom de famille	ANDREOU
Prénom	ANDREAS
Date du début de la charge	2013-09-30
Date de fin de la charge	2018-03-06
Fonctions actuelles	Président
Adresse	77 SIR JOHN ROGERSON'S QUAY, SUITE 105 DUBLIN 2 IRLANDE

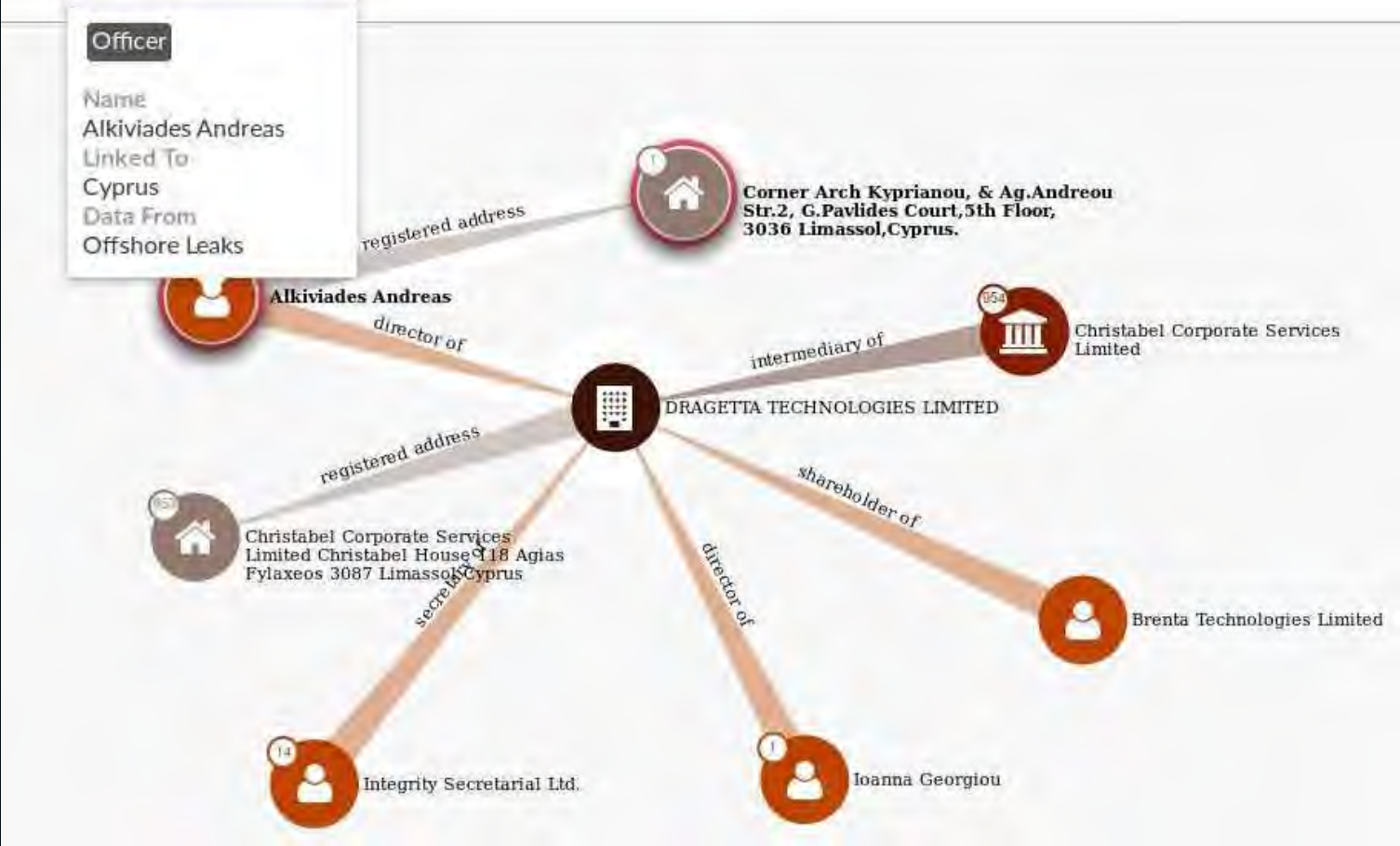
<http://www.registreentreprises.gouv.qc.ca/en/default.aspx>

But I strongly believe that every document refers to **ANDREAS ALKIVIADES ANDREOU** (ΑΝΔΡΕΑΣ ΑΛΚΙΒΙΑΔΗΣ ΑΝΔΡΕΟΥ) since he is a Director of Corporate Finance.



That's very solid grunt for deeper research, we have names, relationships, associations, companies and more that shows how big and powerful this company is. For people who want to continue the research, mentioned director is a good place to start.

Offshore Leaks database mentions **Alkiviades Andreas**, however I am not able to connect this individual to the one from Offshore Leaks. It means, I can't proof that this is the same individual. Only deeper research can confirm the assumption.



<https://offshoreleaks.icij.org/nodes/24310>

Summary

Personally, Mindgeek is one of my favorite corporation, they operate mostly in shadow and almost no one who is not deep into porn industry does not know about them. For such a big company, they do not have any scandals, problems with diversity or other nowadays' corporate issues. You won't hear about them in mainstream because brands like **Pornhub**, **Redtube** or **Youporn** tell by themselves. In some fields it's still a taboo topic to talk about porn industry and so about any ownership. They expand their business aggressively by buying smaller companies, providing new experiences or protecting their content. Social campaigns created by **Pornhub** reached mainstream and they will go this way to serve mainstream-related ads on their platform and be advertised wider. In addition, **AgeID** regulations will most probably be a nail in the coffin for **MG** competitors. I think, in next 10 years, **Mindgeek** will reach level of porn monopoly.

From technical perspective, I would love to work there with all the big data they collect everyday and potential security incidents they experience.

Part 2 will consists of technical analysis of **Mindgeek** assets, how to discover domains and subdomains based only on organization's name, analysis of their mobile application and other OSINT techniques.

Further reading

<https://wiki.openrightsgroup.org/wiki/MindGeek>

The (almost) invisible men and women behind the world's largest porn sites


It's no surprise to anyone to hear that there is a lot of money in the porn industry.


 The Next Web • • Ben Woods



The Porn Connections of Three Local Charities

We at Riptide fancy ourselves as open-minded

 Miami New Times • • Gus Garcia-Roberts



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